

Magone Project Draft Environmental Impact Statement (DEIS)

Appendix C – Project Design Criteria

Blue Mountain Ranger District
Malheur National Forest

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Contents

Project Design Criteria	1
Attachment 1: Aquatic Design Features and Best Management Practices	18
Section A—General Water Drafting Guidance for Road Maintenance and Non-emergency Fire Use for Watersheds with Anadromous Fish in the Blue Mountain Tri-Forest Area.....	18
Section B—National Marine Fisheries Service Juvenile Fish Screen Criteria for Pump Intakes	20
Definitions used in pump intake screen criteria	20
Pump Intake Screen Flow Criteria	20
Pump Intake Screen Mesh Material	21
Pump Intake Screen Location.....	21
Pump Intake Screen Protection	21
Section C—Relevant Project Implementation Criteria for Road Maintenance Activities	21
Road Reshaping and Blading	21
Drainage Structure Maintenance	22
Ditch Relief Culvert Replacement, Installation, or Removal	23
Sign Maintenance and Construction.....	24
Road Snag or Danger Tree Felling.....	24
Logging Out	24
Roadside Brushing.....	25
Dust Abatement	26
Snow Removal	27
Road Closures.....	28
Material Sources	28
Section D—Project Design Criteria (PDCs) Relevant to Aquatics Developed by Blue Mountain Ranger District Interdisciplinary Team	29
Project Design Criteria Relevant to All Project Elements	29
Timber Felling	29
Timber Yarding	30
Hauling	30
Fuels Treatments	31
Temporary Road and Landing Construction	31
Road Maintenance and New Road Construction.....	32
Culvert Installation	32
Road Decommissioning.....	33
“Fish Sticks” and “Fish Crib” Magone Lake Project Design Criteria.....	33
Aquatic Restoration Decision Project Design Criteria for Livestock Crossings and Recreational Trail Crossings within Mid-Columbia River Steelhead Critical Habitat	34
Section E—Best Management Practices	35
T-1 – Timber Sale Planning Process	36
T-4 – Use of Sale Area Maps for Designating Water Quality Protection Needs	36
T-7 – Streamside Management Unit Designations.....	36
T-10 – Log Landing Location	36
T-11 – Tractor Skid Trail Location and Design	36
T-13 – Erosion Prevention Measures during Timber Sale Operations	37
T-18 – Erosion Control Structure Maintenance	37
T-19 – Acceptance of Timber Sale Erosion Control Measures before Sale Closure	37
R-1 – General Guidelines for the Location and Design of Roads	37
R-2 – Erosion Control Plan	37

R-3 – Timing of Construction Activities	38
R-6 and R-7 – Dispersion of Subsurface and Surface Drainage Associated with Roads	38
R-12 – Control of Construction in Streamside Management Units.....	38
R-18 – Maintenance of Roads	38
R-19 – Road Surface Treatment to Prevent Loss of Material	38
R-21 – Snow Removal Controls to Avoid Resource Damage.....	39
R-22 – Restoration of Borrow Pits and Quarries.....	39
R-23 – Obliteration of Temporary Roads.....	39
F-3 – Protection of Water Quality during Prescribed Fire Operations	39
W-5 – Cumulative Watershed Effects	39

Tables

Table C-1. Project design criteria to be applied during implementation.....	1
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Project Design Criteria

Project design criteria (PDCs) are an integral part of each action alternative and serve to mitigate impacts of activities on resource areas. In addition to best management practices and legal requirements, these measures would be applied during implementation (Table C-1).

Table C-1. Project design criteria to be applied during implementation

Project design criteria number	Project design criteria description	Applies to
Botany		
1	In areas where project activities may potentially adversely impact known sensitive plant populations, occupied locations will be designated as “areas-to-protect” (ATPs). These ATPs shall be protected from all ground-disturbing activities. This will be achieved by implementing a no ground disturbance buffer around each site of a size adequate to provide protection. Each buffered area will be determined based upon the site-specific setting, although a recommended standard is 100 feet from the outside edge of the population. All off-road vehicles, trucks, and equipment shall avoid these areas. Decking, yarding, and piling and burning of slash, shall not occur in these areas. Camps and staging areas shall not be allowed. Fire control lines shall not be constructed in these areas. Aerial, hand or vehicle-based ignition of fire in these areas may be done in consultation with a botanist (this will depend upon the particular species expected response to fire). These ATPs shall be identified on sale maps and implementation plans. They may be also identified on the ground with flagging.	All known sensitive plant populations
2	A Forest Service botanist shall be consulted prior to implementation of activities within 200 feet of ATPs. The botanist may flag the site, and/or help lay out in the field the location of nearby skid trails, landings, and roads.	All known sensitive plant populations
3	A Forest Service botanist shall be consulted prior to implementation of prescribed burn treatments in units containing ATPs.	All known sensitive plant populations
4	Logging, non-commercial thinning with ground-based equipment, road construction, and operation of trucks, off-road vehicles, and heavy equipment shall generally not occur in wetlands, wet meadows, springs, seeps, or lithosols (scablands). Skid trails and landings shall not be constructed within, or at the interface of, lithosols (scablands) and forest edges. The main exception to these restrictions will be if it is determined that the activity will benefit a particular sensitive species. When a decision is made to operate in these areas, consultation with a botanist shall occur. If feasible, heavy equipment will only be used in such areas over snow or frozen ground.	All unique habitats
5	Decking, piling, and burning of slash piles shall not occur in non-forested openings, such as lithosols (scablands), meadows, wetlands, springs, and seeps. Lopping and scattering of slash, broadcast burning, and burning of lopped slash under cool, wet conditions shall be allowed in these areas.	All unique habitats
6	Pre-implementation monitoring of selected high probability habitats for sensitive plants may be conducted in specific areas of proposed activities.	Sensitive plants and unique habitats
7	If any new sensitive plant populations are located before, or during project implementation, a Forest Service botanist will be notified. The population will be evaluated, and a mitigation plan shall be developed in consultation with the botanist.	Sensitive plants and unique habitats
8	The integrity of unique habitats shall be maintained. Unique habitats include meadows, rimrock, talus slopes, cliffs, animal dens, wallows, bogs, seeps and springs. This shall be accomplished by incorporating cover buffers approximately 100 feet in width. Utilize additional mitigations/enhancement measures identified	All unique habitats

Project design criteria number	Project design criteria description	Applies to
	through project level analysis (Malheur Forest Plan Forest-wide Standard 56).	
9	When conducting prescribed burning in areas with Pacific yew, the crew should use tactics to minimize fire severity in those areas. All efforts will be made to keep mortality of yew trees to a minimum. Before implementation of burning in areas with high concentrations of yew, the fuels specialist shall consult with a botanist to allow the opportunity to participate in the burning, and/or to conduct monitoring of populations.	Prescribed burning in areas with Pacific yew
10	Newly planted areas should be protected from animals and activities that may prevent or retard establishment. This may include building fences, piling slash, closing areas to vehicles, and/or temporarily changing grazing regimes.	Revegetated areas
11	Native plant materials are the first choice in revegetation for restoration and rehabilitation where timely natural regeneration of the native plant community is not likely to occur. Non-native, non-invasive plant species may be used in any of the following situations: 1) when needed in emergency conditions to protect basic resource values (e.g., soil stability, water quality and to help prevent the establishment of invasive species), 2) as an interim, non-persistent measure designed to aid in the re-establishment of native plants, 3) if native plant materials are not available, or 4) in permanently altered plant communities. Under no circumstances will non-native invasive plant species be used for revegetation.	Revegetated areas
Non-native Invasive Plants		
12	<p>To prevent the introduction and proliferation of invasive plants and to protect sensitive plants, sensitive plant habitat, and general plant habitat from competition, the following standards from the Pacific Northwest Region Invasive Plant Program: Preventing and Managing Invasive Plants Record of Decision (USDA Forest Service, Sept. 2005) will be incorporated into all action alternatives, project implementation plans, and contracts.</p> <p>Prevention Standard 1: Prevention of invasive plant introduction, establishment and spread will be addressed in watershed analysis; roads analysis; fire and fuels management plans, Burned Area Emergency Recovery Plans; emergency wildland fire situation analysis; wildland fire implementation plans; grazing allotment management plans, recreation management plans, vegetation management plans, and other land management assessments.</p> <p>Prevention Standard 2: Actions conducted or authorized by written permit by the Forest Service that will operate outside the limits of the road prism (including public works and service contracts), require the cleaning of all heavy equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering National Forest System Lands.</p> <p>Prevention Standard 3: Use weed-free straw and mulch for all projects, conducted or authorized by the Forest Service, on National Forest System Lands. If State certified straw and/or mulch is not available, individual Forests should require sources certified to be weed free using the North American Weed Free Forage Program standards, or a similar certification process.</p> <p>Prevention Standard 4: Use only pelletized or certified weed free feed on all National Forest System lands. If state certified weed free feed is not available, individual Forests should require feed certified to be weed free using North American Weed Free Forage Program standards or a similar certification process. Choose weed-free project staging areas, livestock and packhorse corrals, and trailheads.</p> <p>Note: No prevention standard 5.</p> <p>Prevention Standard 6: Use available administrative mechanisms to incorporate invasive plant prevention practices into rangeland management. Examples of administrative mechanisms include, but are not limited to, revising permits and grazing allotment management plans, providing annual operating instructions, and adaptive management. Plan and implement practices in cooperation with the</p>	Non-native invasive plants

Project design criteria number	Project design criteria description	Applies to
	grazing permit holder. Prevention Standard 7: Inspect active gravel, fill, sand stockpiles, quarry sites, and borrow material for invasive plants before use and transport. Treat or require treatment of infested sources before any use of pit material. Use only gravel, fill, sand, and rock that is judged to be weed free by District or Forest weed specialists. Prevention Standard 8: Conduct road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants in consultation with District or Forest-level invasive plant specialists, incorporate invasive plant prevention practices as appropriate.	
13	When it is deemed necessary to help reestablish native vegetation, and to prevent non-native invasive species infestations, seeding and/or planting of native plants shall be implemented after ground disturbing activities. Areas that may need treatment include log decks, staging areas, landing zones, temporary roads; slash piles, skid trails, decommissioned roads, and any other disturbed site. A Forest Service botanist, or revegetation specialist, shall be consulted to prescribe appropriate seed mixes, sowing guidelines, and provide assistance with application, protection, and cultivation of seeds and plants.	Revegetation with native plants
14	Conduct road blading, brushing, and ditch cleaning in areas with high concentrations of targeted non-native invasive plants in consultation with invasive plant specialist and incorporate non-native invasive plant species prevention practices as appropriate.	Road maintenance activities
15	Ensure all equipment and vehicles used on National Forest lands are cleaned and free of targeted non-native invasive plant material and seeds. Notify the Forest Service prior to moving each piece of equipment onto National Forest Lands or when moving between units by identifying the location of the most recent operations. Upon request of the Forest Service, arrangements would be made for inspection of each piece of equipment. Contractor and Forest Service shall agree on locations of cleaning and control of off-site impacts, if any.	All equipment and vehicles used on NFS lands
16	Targeted non-native invasive plants that are known to spread due to burning should be appropriately treated prior to prescribed burning. Direct burning through these areas would be avoided. Avoid ignition and burning in areas at high risk for targeted non-native invasive plant establishment or spread due to fire effects.	Prescribed burning
17	Minimize soil disturbance to no more than needed to meet vegetation management objectives	All project activities
Range		
18	Range, fire specialist, and permittees would coordinate activities including scheduling of burning activities in grazing units.	Prescribed burning
19	Use the Forest Post-Fire Interim Grazing Guidelines to aid in determining when to resume grazing after prescribed burning is complete.	Prescribed burning
20	Whenever possible, units to be rested would be burned in the spring of the year to be rested or in the fall prior to the rest year.	Prescribed burning
21	The permittee has the option to exclude cattle grazing from those portions of a pasture that were burned through the use of fencing and could continue to graze the unburned areas of a unit.	Prescribed burning
22	All existing structural range improvements (fences, gates, spring developments, etc.) and permanent ecological plots would be contractually protected. If these structural improvements are damaged during project operations they would be repaired to Forest Service standards prior to livestock scheduled use by the party responsible for causing the damage.	Silviculture and prescribed burning
23	Fence right of ways (6 feet either side of fence), trails, other developments and access to them would be cleared of slash produced by logging or post-sale	Silviculture and prescribed burning

Project design criteria number	Project design criteria description	Applies to
	activities.	
24	If structural improvements are damaged during project operations they would be repaired to Forest Service standards prior to livestock scheduled use by the party responsible for causing the damage.	All project activities
25	Fences cut during the timber sale operations would be repaired by the party responsible for cutting them and would be repaired according to Forest Service standards.	All project activities
26	Actions that result in roads being closed for any period of time, even if detours are present, need to be coordinated with the Blue Mountain Ranger District (BMRD) range program to ensure adequate passage for the purpose of livestock management and activities associated with FS-2200-10: term grazing permit.	Permanent and temporary road closures
27	No structural improvements associated with livestock grazing will be removed, modified, excluded, or otherwise acted upon that would result in a change of livestock management.	All project activities
28	Construction of fencing for the purpose of protection of a resource will be coordinated with the BMRD range program and will not result in loss of grazing land in such a manner that the contractual obligations between the Forest Service and a term grazing permit holder require modification or are no longer able to be achieved.	Fence construction
29	Fences constructed for the purpose of aspen protection, hardwood planting protection, and other restoration activities will not be responsibility of the livestock grazing permit holder to maintain or preserve. The area enclosed within these fences will not be considered excluded from livestock grazing and no permit action or adaptive management action will be taken against a permittee if livestock unintentionally access a fenced area that is designated for restoration.	Fence construction
30	All structural improvements constructed will be done so in accordance with guidance from General Technical Report PNW-GTR-250 (Sanderson et al.1990) and the expertise of a Rangeland Management Specialist.	Rangeland structural improvements
Visuals		
31	<p><i>Unit design and layout – general requirements applicable to all foreground and middleground areas:</i></p> <ul style="list-style-type: none"> • In order to blend treatment units and create free-form vegetation patterns that mimic natural patterns, straight lines and geometric shapes for unit boundaries should be avoided or minimized. • Tree or shrub islands of various shapes and sizes would be retained in a random distribution pattern where possible, to provide a characteristic vegetation appearance while meeting objectives for fuel reduction and bark-beetle risk reduction. <p>This PDC applies to the portions of the following units that intersect the foreground and middleground areas:</p> <p><i>Alternative 2 units:</i> 101, 103, 107, 109, 115, 117, 121, 123, 125, 127, 131, 133, 135, 139, 141, 143, 147, 151, 153, 157, 159, 161, 165, 167, 169, 171, 173, 175, 179, 181, 183, 185, 187, 189, 191, 193, 199, 201, 203, 205, 207, 211, 213, 215, 265, 267, 269, 271, 273, 283, 285, 289, 321, 419, 421, 425, 427, 431 R, 433 R, 435, 437 R, 439, 441, 443, 450, 452, 454, 455, 456, 458, 460 R, 481 R, 482 R, 497, 499, 501, 503, 516, 520, 522, 524, 526, 528, 530, 585 R, 586 R, 587 R, 589, 591 R, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 649, 653, 655, 661, 663, 665, 669, 2045 PROG, 2055 PROG, 4001 R, 4007 R, and 4009 R.</p> <p><i>Alternative 3 units:</i> 101, 103, 107, 109, 115, 117, 121, 123, 125, 127, 131, 133, 135, 139, 141, 143, 147, 151, 153, 157, 159, 161, 165, 167, 169, 171, 173, 175, 179, 181, 183, 185, 187, 189, 191, 193, 199, 201, 203, 205, 207, 211, 213, 215,</p>	Harvest activities

Project design criteria number	Project design criteria description	Applies to
	<p>265, 267, 269, 271, 273, 283, 285, 289, 291, 321, 419, 421, 425, 427, 431 R, 433 R, 435, 437 R, 439, 441, 443, 450, 452, 454, 455, 456, 458, 460 R, 481 R, 482 R, 497, 499, 501, 503, 519, 520, 522, 524, 526, 528, 530, 585 R, 586 R, 587 R, 589, 591 R, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 649, 653, 655, 661, 663, 665, 669, 705, 707, 733, 734, 735, 736, 737, 741, 743 R, 745, 746, 747, 749, 755 R, 759, 761, 763, 765, 767, 769, 774, 775, 776 R, 777, 778, 779, 780, 782 R, 784, 785, 787, 791, 831, 2045 PROG, 2055 PROG, 4001 R, 4007 R, and 4009 R.</p> <p><i>Alternative 4 units:</i> 101, 103, 107, 115, 121, 127, 131, 139, 141, 143, 147, 151, 153, 159, 161, 165, 167, 169, 171, 173, 175, 179, 181, 183, 185, 187, 191, 199, 201, 203, 205, 207, 211, 213, 265, 267, 269, 271, 273, 285, 289, 321, 421, 425, 427, 439, 441, 443, 455, 497, 499, 501, 503, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 639, 641, 649, 653, 655, 661, 663, 665, 669, and 831.</p> <p>Responsible: Layout crew, sale administrator</p>	
32	<p><i>Management Area 14 immediate foreground design and layout – specific requirements:</i></p> <ul style="list-style-type: none"> • The following design features are specific to treatment areas that fall within the immediate foreground of visual corridors or recreation sites. The immediate foreground is 150 feet from the visual/scenic corridor center point (road, lake or trail) into the project planning area or 150 feet on either side of a recreation site. The following design features apply to the first 150 feet unless otherwise stated: • If necessary, unburned slash in the foreground area should be scattered to reduce the color contrast of any exposed soil at burn-pile sites. • On slopes facing the road/lake/trail, slash piles would be placed 50 feet or more away from the road/lake/trail where practicable to reduce visual impacts. Slash within 150 feet of the road should be removed, grapple-piled and burned, or hand-piled and burned. • If after one year pile-burned sites are visible from the road/lake/trail, reburning, scattering, covering with natural duff, or masticating burned piles should be accomplished in order to minimize visual impact of management activities. • Where marking paint can be seen, it is to be applied to the side of the tree facing away from the road/lake/trail. Flagging and signs that are visible from the road/river/trail should be removed upon completion of the harvest unit activities. • Stumps should be cut flush or close to the ground where practicable and always within 6 inches of the ground on the uphill side. • The number of landings along Forest Roads 3618, 3620, and County Road 18 should be kept to a minimum. Landing size should be minimized and landings should be shaped to blend with the contours of the landscape to maintain visual standards. Use established openings or old landings where possible. Natural vegetation should be retained between the landing and the road to serve as vegetative screening where practical and not in conflict with WUI objectives. • Prior to harvest, the locations and clearing for all temporary roads and landings within 150 feet of Forest Roads 3618, 3620 and County Road 18 will be reviewed by a landscape architect or recreation specialist. Harvest activities in this zone must maintain a partial retention (slightly altered) visual objective. The ground disturbance must be minimal and the size and number of landings in the zone must be minimized. If the burning of the landing piles in this zone would cause more than 20 percent tree mortality surrounding the piles, consider either chipping or hauling the slash to a disposal area should be considered. • Landings and skid trails should be returned to their original/natural profile, with no continuous berms or soil piles left behind. This does not preclude the use of water bars to reduce erosion on skid trails. Landings and skid trails should be re-vegetated with native grasses and forbs to protect soils and watershed processes. 	Harvest activities, landings, skid trails, and prescribed burning

Project design criteria number	Project design criteria description	Applies to
	<ul style="list-style-type: none"> Landings and skid trails should be returned to their original/natural profile, with no continuous berms or soil piles left behind. This does not preclude the use of water bars to reduce erosion on skid trails. Landings and skid trails should be re-vegetated with local, native grasses and forbs to enhance skip and gap structure, protect soils, and watershed processes. Where practical minimize skid trails and roads located perpendicular to the road in order to minimize the forest visitor's direct views into landings. Avoid placing skid trails within 100 feet of the road where practical. Harvest units within the immediate foreground shall have a mosaic of stocking levels and tree sizes will be retained. Abrupt transitions between thinned and unthinned stands should be avoided in the foreground. Burning prescriptions in visual foreground areas should be developed to produce low intensity fire, minimizing damage to the larger-diameter overstory trees. Those trees greater than 21 inches DBH within 200 feet of the road/lake/trail would be protected from high intensity flames that could cause mortality. This protection could include such activities as raking needles away from the base of trees or wetting down the area around the tree prior to ignition. Burning intensities will be controlled by ignition methods and techniques to retain a minimum of 80 percent of the live crowns. Isolated small trees within a stand of larger trees may end up having less than 80 percent of the live crown remaining. No marking paint should be applied within the Magone Lake Recreation Area if applicable, if not apply marking paint to the backside of the tree out of view from the lake and Forest Roads 3618 and 3620 and County Road 18. Shall provide signing that is minimal and low key by avoiding shiny or metallic materials and bright or white colors. <p>This PDC applies to the portions of the following units that are located 150 feet from the visual/scenic corridor center point (road, lake or trail) or 150 feet on either side of a recreation site:</p> <p><i>Alternative 2 units:</i> 101, 103, 107, 109, 117, 121, 125, 127, 131, 133, 139, 141, 143, 147, 151, 153, 157, 159, 161, 165, 167, 169, 173, 175, 179, 181, 183, 185, 187, 189, 191, 199, 203, 205, 207, 267, 283, 285, 427, 431 R, 433 R, 435, 437 R, 441, 443, 455, 458, 497, 621, 625, 633, 637, 639, 663, 665, and 2045 PROG.</p> <p><i>Alternative 3 units:</i> 101, 103, 109, 117, 121, 125, 127, 131, 133, 139, 141, 143, 147, 151, 153, 157, 159, 161, 165, 167, 169, 173, 175, 179, 181, 183, 185, 187, 189, 191, 199, 203, 205, 207, 267, 283, 285, 291, 427, 431 R, 433 R, 435, 437 R, 441, 443, 455, 458, 497, 621, 625, 633, 637, 639, 663, 665, 777, 831, and 2045 PROG.</p> <p><i>Alternative 4 units:</i> 101, 103, 107, 121, 127, 131, 139, 141, 143, 147, 151, 153, 159, 161, 165, 167, 169, 173, 175, 179, 181, 183, 185, 187, 191, 199, 203, 205, 207, 267, 285, 427, 441, 443, 455, 497, 621, 625, 633, 639, 663, 665, and 831.</p> <p>Responsible: Layout crew, sale administrator</p>	
33	<p><i>Design and install facilities that are:</i></p> <ul style="list-style-type: none"> Simple and durable in nature, adequate for the intended function, and devoid of unnecessary frills and personal preference options. Cost-efficient both from the standpoint of initial installation and continued operation and maintenance. In close harmony with the surrounding environment. Safe to use and in conformance with all applicable standards. Suitable for both traditional and nontraditional users. In compliance with the authorities at FSM 2330.12 setting out Federal and agency requirements related to the accessibility and design of recreation 	Facility installation

Project design criteria number	Project design criteria description	Applies to
	programs, sites, and facilities. Design facilities so that they are as natural, simple, and unobtrusive as possible. Design and build rustic-looking facilities so that they become part of the attraction.	
Recreation		
34	Protect water lines at Magone Lake Recreation Area.	
35	Protect fencing and trees around and within the springs at Township 12 South, Range 32 East, section 16 off Forest Service Road 3600-015 and 3600-102.	
36	The integrity of established dispersed campsites shall be preserved. Placement of landings should only occur at established dispersed campsites when no other allowable option exists.	
37	To maintain the natural appearances of the setting and maintain Recreation Opportunity Spectrum (ROS) norms: After trail construction as soon as practicable, restore areas impacted of vegetation as a result of project activities. Maintain natural features in the landscape such as tree clumping and large trees when construction or alteration of trails. To the extent possible, provide for curvature in trail layout and alignment so that the rider can experience views and surrounding landscape.	
38	To meet the following Designed Use and Trail Class standards for a paved path on the east side of Magone Lake: Designed use: Hiker/Pedestrian ¹ Trail Class 5, Fully Developed Tread wide, firm, stable, and generally uniform Width generally accommodates two-lane and two-directional travel, or provided frequent passing turnouts if not a two-lane. Commonly hardened with asphalt or other imported material Utilize FS Outdoor Recreation Accessibility Guidelines (FSORAG) and Forest Service Trails Accessibility Guidelines (FSTAG) ² Prohibit recreational use of motorized vehicles and equestrian use on all paved trail section. Allow motorized wheelchairs or mobility devices ³ on the paved path in pursuant to 36 CFR 212.1.	
Soils		
39	Keep soil impacts as small as practical (as determined by the line officer), especially long-lasting impacts; and keep detrimental soil impacts from this project	All ground disturbing

¹ Designed use: The managed use of a trail that requires the most demanding design, construction, and maintenance parameters and that, in conjunction with the applicable trail class, determines which design parameters will apply to a trail.

² The FSTAG apply only to trails that meet all three of the following criteria: 1) The trail is new or altered. An alteration to a trail is a change in the original purpose, intent, or function for which the trail was designed. 2) The trail has a designed-use (in accordance with the Forest Service trails terminology, design and management processes) for hiker/pedestrian use. 3) The trail connects either directly to a trailhead or to a currently accessible trail.

³ A wheelchair or mobility device, including one that is battery-powered, is a device that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for use in an indoor pedestrian area (Title V, sec. 507c, of the ADA; 36 CFR 212.1). “Designed solely for use by a mobility-impaired person for locomotion” means that the wheelchair was designed and manufactured solely for use for mobility by a person with a disability. Thus, this term does not include a motorized unit that has been retrofitted to make it usable by a person with a disability. “Suitable for use in an indoor pedestrian area” means usable inside home, mall, courthouse, or other indoor pedestrian area.

Project design criteria number	Project design criteria description	Applies to
	to less than 20% of the area of each unit.	activities
40	<p>For harvesting with low ground pressure harvesters and forwarders, the following design elements apply:</p> <ul style="list-style-type: none"> Forwarders shall have a maximum of 12.0 pounds/square inch. Forwarder trails shall be spaced a minimum of 50 feet apart, center to center. The machinery will be operated only when the soil is not wet. (For forwarders “wet” means when ruts would be 3 inches or deeper on a continuous 50 feet or more of forwarder trails.) <p>The machinery will be operated only on slopes of 35% or less, except for short distances.</p>	Logging and biomass
41	No heavy equipment shall be allowed on inclusions of highly erodible soil. “Inclusions of highly erodible soil” generally means areas larger than 50 feet diameter, and either 1) steeper than 30%, with less than 75% ground cover, 2) 20-30% slope with less than 50% ground cover, or 3) 10-20% slope with less than 25% ground cover. A Forest Service soils specialist can approve exceptions (either stricter or less strict). Inclusions of highly erodible soil probably occur in units 219, 615, and others.	Logging and biomass
42	Grapple piling and mastication shall be done with low ground pressure (< 8.5 psi) machinery on dry, frozen, or snow covered soil, and machinery will stay on existing skid trails where possible. “Dry” means July through September, or obviously dry in the top 4 inches during other months. “Frozen” means frozen to a depth of 4 inches or more. “Snow covered” means sufficient snow strength and depth to prevent soil disturbance and compaction.	Logging and biomass activities (grapple piling)
43	Slash shall not be dozer piled, unless the soil scientist determines that Forest Plan soil quality standards would be met.	Slash treatment
44	Skid trail locations shall be designated and approved prior to logging. On areas where existing skid trails spaced 100-140 feet apart can be reused, reuse the old skid trails. Otherwise, space skid trails about 120 feet apart where practical, using existing skid trails where possible and appropriate. Skid trails should average less than 14 feet wide.	Skid trails
45	Draw bottoms are not appropriate for skidding or forwarding. If the only way to log a particular part of a unit is to skid in the draw bottom, that part of the unit will be excluded from harvest. This may affect parts of units 169, 197, 199, 229, 277, 619, 778, 793, 798, and others.	Skid or forwarder trails
46	Avoid downhill skidding or forwarding on slopes steeper than 35%, where feasible, using directional felling and tractor winching. There shall be no downhill skidding or forwarding on slopes steeper than 44% for more than 40 feet.	Logging and biomass activities
47	Avoid skidding or forwarding uphill for more than 40 feet on slopes steeper than 35%.	Logging and biomass activities
48	No skidding will be done under wet soil conditions, when ruts 6 inches or deeper would form on a continuous 50 feet or more of skid trails. This includes places with moist soil, probably including parts of units 643, 703, and others.	Logging and biomass activities (skidding)
49	No skidding or forwarding would be allowed in moist meadows unless approved by a soil scientist or hydrologist.	Logging and biomass activities
50	Re-use existing landings where feasible and where they are away from shallow soil areas and ephemeral draws unless approved by a hydrologist, soil scientist, or fisheries biologist.	Landings
51	Skidders or forwarders shall not be allowed off trails unless the soil is frozen or other conditions approved by a soil scientist. Directional felling and/or winching shall be used when necessary. Low ground-pressure equipment (<8.5 pounds per	Logging and biomass activities

Project design criteria number	Project design criteria description	Applies to
	square inch) can be allowed off skid trails under, dry, frozen, or snow covered conditions.	
52	Runoff and erosion from skid trails, skyline corridors, and tractor-winch furrows shall be controlled by the use of cross drains or comparable measures. Outfalls of the cross drains shall be clear and located on soil where water will infiltrate, not on shallow or impermeable soil. Cross drains on skid trails should be spaced appropriately for the terrain.	Logging and biomass activities
53	Erosion from subsoiled skid or forwarder trails shall be controlled by subsoiling in a “J” pattern, by water bars, or by comparable measures. If runoff cannot be diverted out of the furrows (such as in draw bottoms), do not subsoil. Skid trails on slopes steeper than 28% should not be subsoiled. Do not subsoil sections of skid trails where excessive rock will be pulled to the surface.	Logging and biomass activities
54	For units 239 (alternatives 2 and 3), 617 (alternatives 2, 3, and 4), 653 (alternatives 2, 3, and 4), 703 (alternative 3), 723 (alternative 3), and 795 (alternative 3), either (a) they shall be logged with a low ground-pressure forwarder-harvester system, or (b) they shall not have biomass removal, except at the time of logging, with the same equipment, or (c) they shall be logged on snow covered or frozen soil.	Logging and biomass activities
55	For unit 615 (alternatives 2, 3, and 4) either (a) it shall not have biomass removal, except at the time of logging, with the same equipment, or (b) it shall be logged on snow covered or frozen soil.	Logging and biomass activities
56	For units 230 (alternatives 2, 3, and 4) and 603 (alternatives 2, 3, and 4), either (a) they shall be logged on snow covered or frozen soil, or (b) skid trails shall be subsoiled by the purchaser, or (c) they shall be logged with a low ground-pressure forwarder-harvester system. In addition, for options (b) or (c) no biomass harvest shall be allowed on these units unless it is done at the same time as the logging, using the same equipment.	Logging and biomass activities
57	For units 179 (alternatives 2, 3, and 4) and 241 (alternatives 2, 3, and 4), either (a) they shall be logged on snow covered or frozen soil, or (b) skid trails shall be subsoiled by the purchaser. In addition, for option (b) no biomass harvest shall be allowed on these units unless it is done at the same time as the logging, using the same equipment.	Logging and biomass activities
58	Heavy equipment shall not be used more than 10 feet off roads during juniper removal, except in stands with a commercial thinning prescription.	Prescribed burning
59	Prescribed fire control lines shall not be built down draw bottoms.	Prescribed burning
60	Slash piles shall not cover more than 5 percent of any unit.	Pile burning
61	Temporary roads in scabs shall not be steeper than 6%. They shall be constructed and used only when the soil is obviously dry to a depth of 10 inches or throughout the profile (whichever is less), or frozen, or protected by snow. After use, 4 inches of slash shall be placed at outfall of waterbars, and slash shall be scattered on the surface of the road. Exceptions can be approved in advance by a soil scientist or hydrologist.	Temporary road construction
Heritage		
62	The archaeological sites within the Magone project planning area that are eligible or potentially eligible for listing on the National Register of Historic Places (NRHP) will be protected from adverse impacts caused by timber, fuels reduction, precommercial thinning, and aquatic actions. Other management actions that may have potential to adversely impact archaeological sites will be assessed on a case by case basis. A report will be generated and submitted to SHPO for review and concurrence.	All project activities
63	If during project activities cultural material is encountered, all work will cease immediately and a Forest Service archaeologist contacted to evaluate the	All project

Project design criteria number	Project design criteria description	Applies to					
	inadvertent discovery. A mitigation plan, if needed, will be developed in consultation with the Oregon State Historic Preservation Office (SHPO).	activities					
64	A “No Effect” determination will apply in those areas where sites and commercial logging activities coincide if the sites are avoided completely or over-snow logging protocols are implemented then refer to attached Appendix B.	Harvest activities					
65	There will be no slash piling to exceed 4 x 4 x 4 feet in size, either by hand or ground-based machines, within site boundaries. Burning of slash is preferred to be conducted outside site boundaries. If burning of slash is necessary, however, the project lead must check with the archaeologist / heritage specialist for concurrence regarding historic sites, rare isolates, and / or features.	Harvest activities					
66	All eligible and potentially eligible (unevaluated) historic properties with structural remains or other combustible feature types will be avoided / protected during all burning activities. Eligible historic remains will be identified on the ground and proper protection measures will be conducted during the burning activities.	Prescribed burning					
67	Low intensity burning that will have no effect on pre-contact lithic assemblages is permitted under the terms of the Management Strategy for the Treatment of Lithic Scatter Sites (Keyser et al. 1988).	Prescribed burning					
68	Landings will not be located within 100 feet of known cultural resource sites.	Landings					
69	All units or proposed land treatments that require fencing to facilitate aspen restoration and, that also contain eligible or potentially eligible sites, will utilize above ground buck and pole fencing in order to avoid potential adverse effects to the sites.	Aspen restoration					
70	All aspen units that contain and / or are adjacent to eligible and unevaluated archaeological sites will be monitored during and / or after project implementation. These units are identified. Please notify the project archaeologist prior to implementation.	Aspen restoration					
Silviculture							
71	No direct ignition will occur in plantations until mean tree size is at least 7.0 inches DBH.	All plantations					
Wildlife							
72	Raptors: If an occupied bald or golden eagle nest is found within the project planning area, management activities would be prohibited within ½ mile of the nest from March 15th – July 15th. In addition, a nest stand would be delineated to protect nest site structure and no management activities would take place in or within 500 feet of designated nest stands.	All project activities					
73	Raptors: If an occupied Peregrine falcon nest is found within the project planning area, management activities within ¼ mile of the nest would be prohibited from April 1st – August 31st.	All project activities					
74	Raptors: There is one designated northern goshawk PFA within the project planning area. No activities are allowed within northern goshawk PFAs or within ½ mile of occupied goshawk nest sites from April 1st -Sept 30. No timing restrictions apply to unoccupied nest sites.	All project activities					
75	Raptors: The district wildlife biologist will be consulted if any raptor nest is discovered prior to or during project implementation. Nests will be flagged and a ¼ mile disturbance buffer will be designated until species determination is validated. In addition, a nest stand will be delineated to protect nest site structure. Determination of restrictive periods and activity buffers will be species-specific and based upon current Forest and Regional guidance.	All project activities					
76	Project Management Restrictions for Raptors <table><tr><td>Wildlife</td><td>Timing—all</td><td>Timing</td><td>Timing—</td><td>Management</td></tr></table>	Wildlife	Timing—all	Timing	Timing—	Management	All project activities
Wildlife	Timing—all	Timing	Timing—	Management			

Project design criteria number	Project design criteria description					Applies to
	resource	activities prohibited	restriction buffer—activities prohibited	activities permitted	restriction for all activities	
	Northern goshawk nest sites	Activities prohibited: April 01 – Sept 30	Within ½ mile of nest site	Activities can occur: October 1- March 31	No habitat removal within 30-acre nest stands or designated nest stands	
	Occupied raptor nest sites (excluding eagles and great grey owls)	Activities prohibited: March 01- July 31	Within 660 feet (1/4 mile)	Activities can occur: August 1- February 28	No management activities (i.e., thinning) within 100 feet of nest sites	
77	Big game: Activities will be restricted, on a site-specific basis, from December 1 – April 15, in areas with known concentrated winter range use.					Areas with known concentrated big game winter range use
78	Big game: Where possible, provide screening / hiding cover >150 feet from existing road corridors.					Areas within 150 feet of existing roads
79	Big game: Any fence construction or replacement will incorporate protective design modifications for wildlife following BMRD wildlife fencing guidelines (i.e., smooth bottom wire, total height <42 inches).					Fencing activities
80	Snags and downed wood / old growth: Please see 'Wildlife Habitat Requirements' in Silviculture Prescription Section.					Harvest activities
81	Snags and downed wood / old growth: No treatments will occur in Dedicated Old Growth stands					All project activities
82	Snags and downed wood / old growth: Treatments in Replacement Old Growth stands will be such that old-growth characteristics will be achieved quicker or enhanced in that stand.					Harvest activities
83	Snags and downed wood / old growth: Snags will not be targeted for removal unless identified as a safety hazard. Hazard snags felled will be left on site and stumped as high as possible to alleviate the safety hazard.					All project activities
84	Roads: Effectively close or obliterate all temporary roads created for project entry. Subsoil or utilize excavator bucket teeth to loosen compacted soils on all temporary roads. Pull slash and woody materials over treated surfaces to establish effective ground cover protection, where available. Reseed with native vegetation where possible.					Temporary roads
85	Roads: Ensure previously closed roads and new road closure proposals become effectively closed in Management Area 4a to protect wintering big game and winter range habitat.					Road closures
86	Mechanical treatments (harvest and precommercial thinning): Horizontal hiding cover will be provided by retaining non-thinned patches of forest trees as necessary throughout the project planning area and on relatively flat topography. Leave 5-25% of the area untreated in patches of 1-10 acres. Patches in larger units may be greater than 10 acres in size. These patches should not be near the boundary of private land or roads. Wherever possible, align cover patches with					Harvest activities

Project design criteria number	Project design criteria description	Applies to
	designated connectivity corridors, particularly in larger treatment units. Leave patches must contain satisfactory to marginal cover to be considered effective leave patches.	
87	Mechanical treatments (harvest and precommercial thinning): Please see 'Wildlife Habitat Requirements' in Silviculture Prescription Section for additional information.	Harvest activities
88	Prescribed burning (underburning and pile burning): Underburn units will be designed to include areas of similar fuels conditions using trails and roads as boundaries, wherever possible, to reduce resource damage from fireline construction.	Prescribed burning
89	Prescribed burning (underburning and pile burning): To protect riparian wildlife habitat, direction ignition in riparian corridors would take place only when needed for prescribed burning control and containment and in relation to site-specific riparian restoration treatments. Fire may be allowed to back into riparian areas with the objective of maintaining a minimum of 40-50% of the shrub layer to meet migratory bird objectives.	Prescribed burning
90	Prescribed burning (underburning and pile burning): Individual burn blocks, located in riparian areas, larger than 500 contiguous acres will require a wildlife biologist's input to ensure that wildlife objectives such as big game forage for winter range and neo-tropical migratory bird objectives are being met.	Prescribed burning
91	Prescribed burning (underburning and pile burning): Prescribed burning will be 'fall only' in riparian zones, except for site-specific riparian restoration treatment areas.	Prescribed burning
92	Prescribed burning (underburning and pile burning): Burn crews would watch for signs of calving and fawning areas (such as lone animals, fawns, or calves; May 1 –June 30). If it is determined that the burn unit could be in fawning or calving areas, crews would search the immediate area for calves/fawns and avoid lighting where young are discovered.	Prescribed burning
93	Prescribed burning (underburning and pile burning): Avoid ignition within 50 feet of standing dead trees (12 inch DBH or greater) and 100 feet of designated wildlife trees.	Prescribed burning
94	Prescribed burning (underburning and pile burning): Burning prescriptions in designated connectivity corridors will be designed to produce low intensity fire, minimizing damage to large diameter overstory trees.	Prescribed burning
95	Prescribed burning (underburning and pile burning): In order to protect habitat for old-growth dependent species, limited pile burning (in a mosaic) in OFMS stands adjacent to designated DOGs and ROGs. Some piles (maximum of 6 feet by 6 feet) will be kept intact and unburned to increase wildlife habitat (for pine marten, small mammals, etc.)	Prescribed burning
96	<p>Prescribed burning (underburning and pile burning): Prescribed burning within aspen stands will be site-specific, but may include the following to protect wildlife habitat:</p> <ul style="list-style-type: none"> • Burning within aspen stands will be avoided if extensive aspen suckering is already present. • Direct ignition in aspen stands on a case-by-case basis and for pile burning only. • If direct ignition occurs with underburning, the stand must be fenced and wildlife breeding season restrictions will be established. <p>To improve stand health and productivity, competing conifers will be removed and the stand will be fenced whenever possible (preferably fall burning).</p>	Prescribed burning
97	Connectivity: Connectivity corridors established between late and old structure (LOS) stands and between designated MA-13 "Old Growth" (as per LRMP	All project activities

Project design criteria number	Project design criteria description	Applies to
	direction) would be maintained to meet Forest Plan Amendment # 2. Amendment # 2 directs maintenance of connectivity between LOS habitats to allow free movement old growth-related wildlife species.	
98	Connectivity: As per Forest Plan Amendment #2 (connectivity corridors) <i>“...manage canopy closure at the upper 1/3 of site potential. Corridors must be at least 400 feet wide at their narrowest point.”</i>	All project activities
99	Connectivity: Where LOS stands do not exist and connectivity is not required, connectivity will be created and maintained to facilitate big game movement across large treated landscapes.	All project activities
100	If a waiver is requested to operate outside of the timelines and restrictions as described in the above measures, the District Wildlife Biologist and District Ranger will be consulted prior to approval.	All project activities
Aquatic Resources		
101	See Attachment 1 for aquatic project design features.	All project activities
Watershed		
102	Riparian Habitat Conservation Areas (RHCAs) for Category 1, 2, and 4 streams and for Category 3 and 4 wetlands shall be consistent with PACFISH (100-300 foot standard buffer widths).	All project activities
103	The General Water Quality Best Management Practices, Pacific Northwest Region, November 1988 (USDA Forest Service 1988) and the National Best Management Practices for Water Quality Management on National Forest System Lands, Vol. 1: National Core BMP Technical Guide (2012) shall be applied to project activities. Full descriptions of each BMP may be found in the Attachment 1, Section E.	All project activities
104	PACFISH standards and guidelines shall be applied to project activities. Timber Management, Roads Management, and Fire/Fuels Management standards and guides apply to this project.	Harvest activities, prescribed burning, and roads activities
105	Trees felled within or into RHCAs (including danger trees and those felled for road construction/reconstruction and landings, and aspen restoration) shall be felled into streams where feasible to provide LWD or left within the RHCA in accordance with PACFISH Standard RA-2 because streams in the aquatics analysis area are deficient in LWD. Felled trees may be removed by self-loading log trucks (from roads) or tracked excavators or similar equipment and transported off-site for use in aquatic restoration projects as determined by a MNF aquatics specialist. Where feasible, trees to be felled shall be pushed over with rootwad intact, rather than cutting (unless felled as part of riparian thinning treatments).	Trees felled within or into RHCAs
106	The Forest Service will require a Hazardous Substances Plan and Prevention of Oil Spill Plan from contractor which will be reviewed and approved prior to implementation activities. Fuels and other toxicants shall not be stored within RHCAs, and other provisions of PACFISH Standard RA-4 shall be implemented.	Equipment use
107	Heavy equipment and machinery shall be inspected for hydraulic or other leaks before working near RHCAs. Leaking or faulty equipment will not be used. Equipment with accumulations of oil, grease, or other toxic materials will be cleaned in pre-approved sites outside RHCAs.	Equipment use
108	The work period for instream work on fish-bearing streams shall be July 15 through August 15, as specified in the Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources, June 2008. Conduct In-stream activities shall be conducted during dry-field conditions – low to moderate soil moisture levels. See Soils PDCs for definition of dry conditions. [The work period for instream work, including road decommissioning within or immediately adjacent	All project activities

Project design criteria number	Project design criteria description	Applies to
	to the active channel will be July 15 through August 15, as specified in the Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources, June 2008.]	
109	Heavy equipment, except for instream or related work, shall not be used in RHCAs and road vehicles shall not be used off road within 100 feet of streams, springs, or wetlands. Heavy equipment used for road construction, reconstruction, and decommissioning shall operate within the prism of the road or of the prism of the road under construction. Heavy equipment used for aquatic restoration activities shall follow appropriate Project Design Criteria included in the Aquatic Restoration Biological Opinion II.	Heavy equipment use
110	Placement of the new culverts would be consistent with Region 6 fish passage guidance and in accordance with the Regional General Permit issued by the U.S. Army Corps of Engineers. Minimization measures for fisheries, watershed function, water quality, and soil conditions include those identified in the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (FWS) 2013 Aquatic Restoration Programmatic Biological Opinion version 2 (ARBO) as well as PDCs developed by the Blue Mountain Ranger District interdisciplinary team.	Culvert placement
111	Product haul shall occur during the Commercial Use Period (June 1 – January 15), unless otherwise authorized by the Forest Engineer. The Commercial Use Period is intended to prevent weather-related road damage, but actual field conditions may necessitate suspending haul to prevent road damage at any time. Product haul is also limited to conditions that will not result in Resource Damage, as described in the June 2009 Malheur National Forest Commercial Road Use Rules (CRUR).	Haul
112	<p>The Design Elements included in the Malheur National Forest Timber Haul Guidelines shall be applied.</p> <ul style="list-style-type: none"> • During product haul, weather conditions are monitored daily for the chance of precipitation by the Timber Sale Administrator, Hydrologist or Fish Biologist. • During product haul, road conditions shall be monitored by the Timber Sale Administrator daily for indications of Road Distress, defined in the CRUR as visible road conditions that occur as a result of road use, or a combination of road use and weather, which indicate that damage to a road or the adjacent resources may occur under existing conditions. Examples of indicators include, but are not limited to, excessive dust, compromised or improper functioning road drainage, muddy ditch water, mud tracked onto asphalt or aggregate surfaced roads, and significant distortions of the road surface such as tracks, ruts, potholes, washboarding, asphalt cracking or settling. • When the Timber Sale Administrator observes indications of Road Distress, one or more of the following actions would be taken: 1) perform maintenance work (including installation of additional erosion control materials); 2) change method of operations; 3) strengthen road surface to avoid damage; or 4) suspend operations until conditions change. • Haul will cease at any time when the travelway of the road is wet and turbid water or fines are observed moving off the road surface to ditchlines that deliver to stream channels regardless of time of year. • Timber haul on gravel and native-surface roads will be limited to dry and/or frozen conditions. • During product haul on native-surface roads, the road surface at all approaches to stream crossings will be rocked to maintain as close to an 8-inch lift as the travelway width allows, for a distance of 100 feet on either side of the stream. This action will lead to a reduction in sediment delivery. • Prior to annual haul, mitigations will be implemented to minimize sediment delivery to critical habitat for MCR steelhead and Columbia River bull trout. Examples of mitigation measures will include but are not limited to sediment 	Haul

Project design criteria number	Project design criteria description	Applies to
	<p>fences or certified weed free straw bales in ditch lines and mulching.</p> <ul style="list-style-type: none"> Apply mitigation and BMPs for dust abatement (water) during dry conditions, as directed by physical scientist or road engineer. <p>Roads exempt from haul restrictions (due to no mechanism for sediment delivery) include paved roads, surfaced ridge top roads, surfaced outsloped roads with no ditch or stream crossings, and any roads while hauling over snow or frozen conditions.</p>	
113	Utilize erosion control measures (sediment filters or certified weed free straw bales) and operate machinery only on road prism during road construction and reconstruction activities.	All project activities
114	Locate temporary roads outside sediment delivery zones (determined by soil type, ground vegetation, and slope), meet best management practices for controlling surface runoff and erosion, and keep machinery on approved roadway.	Temporary road construction
115	Obliterate temporary roads by some combination of the following: recontouring slopes (removing cut and fill slopes); subsoiling (loosening) compacted soils in a "J" pattern to a depth of 16 inches (unless prevented by bedrock or rock content of soils); pulling berm; pulling slash (where available); planting or seeding disturbed areas with native species that naturally occur in the project planning area to achieve a minimum of 35% ground cover; restoring natural drainage patterns and waterbarring as needed; and/or disguising the first hundred yards of travel way with large pieces of organic material such as cull logs and tops of trees. Methods will be determined in consultation with a hydrologist, fisheries biologist, or soil scientist.	Temporary road construction
116	The Malheur National Forest guidance for removing culverts and re-shaping stream crossings shall be followed for road decommissioning or storm-proofing of closed roads. (Obtain approval from district fisheries biologist and hydrologist on specific methods for removing culverts from first or second order streams.)	Culvert placement
117	Erosion control measures (sediment filters or certified weed free straw bales) shall be applied during road decommissioning and machinery shall be operated only on road prism during road decommissioning.	Road decommissioning
118	Roads shall be decommissioned using the following practices or a combination of the following: recontouring slopes (removing cut and fill slopes); subsoiling (loosening) compacted soils in a "J" pattern to a depth of 16 inches (unless prevented by bedrock or rock content of soils); pulling berm; pulling slash (where available); planting or seeding disturbed areas with native species that naturally occur in the project planning area to achieve a minimum of 35% ground cover; restoring natural drainage patterns and waterbarring as needed; disguising the first hundred yards of travel way with large pieces of organic material such as cull logs and tops of trees or by other practices that shall be approved in advance by the project a hydrologist, fisheries biologist, or soil scientist. Methods shall be determined in consultation with a hydrologist, fisheries biologist, or soil scientist. (Road decommissioning would be completed in accordance with the Regional General Permit issued by the U.S. Army Corps of Engineers. Minimization measures for fisheries, watershed function, water quality, and soil conditions include those identified in the NMFS and FWS 2013 ARBO as well as PDCs developed by the Blue Mountain Ranger District interdisciplinary team.)	Road decommissioning
119	Road decommissioning and road stormproofing on closed roads shall be conducted during dry-field conditions – low to moderate soil moisture levels. See Soils Design Criteria for definition of dry conditions.	Road decommissioning
120	Timber harvest units, including skid trails and landings, shall not be located within RHCAs unless approved in advance by the project hydrologist or fish biologist. Designated crossings of Category IV streams shall be approved in advance by the project hydrologist, fish biologist or soil scientist.	Harvest

Project design criteria number	Project design criteria description	Applies to
121	Ephemeral draws shall be protected by site-determined, no commercial (or biomass) cut buffers (10-50 feet on each side). Small trees, commonly referred to as precommercial or non-commercial, may be thinned within ephemeral draw buffers; thinned small trees shall be left in the draws up to a maximum fuel loading (approximately 8-15 tons/acre) determined by the project fuels specialist. Ephemeral stream channels should have protections to minimize equipment disturbance of duff and soil, and should not be used as skid trails, landing sites, or as road locations. Ephemeral draws, not within RHCAs, are to meet the following down wood requirements to reduce risk of upward migration and channel initiation: retain all wood embedded in the soil; retain at least 5 pieces of wood >12 inches diameter and >20 feet in length per 1,000 feet of draw bottom (average 1 piece per 200 feet); retain at least 20 pieces of wood >6 inches diameter and >10 feet in length per 1,000 feet of draw bottom (average 1 piece per 50 feet). Ephemeral draws with a gradient of 5% or more will need to be visited by the hydrologist to determine if any additional site specific mitigation is required.	Harvest
122	Heavy equipment shall be permitted only at designated crossings within the ephemeral draw buffer.	Harvest
123	Skyline yarding corridors (sky roads) are permitted across streams and tailholds, including heavy equipment that is “walked” in, may be located within RHCAs with approval of the project hydrologist or fish biologist. Corridors shall be less than 12 feet wide, spaced greater than 100 feet apart where they cross the streams, be located as close to perpendicular to the channel as possible, and can range from 350 to 1000 feet in length.	Harvest
124	Skyline logging shall use one end suspension at the minimum. Logs shall be fully suspended over streams.	Harvest
125	Skyline corridors shall not be located in ephemeral draws. Skyline corridors that cross ephemeral draws at less (or more) than an approximate perpendicular angle shall be approved in advance by the project hydrologist or soil scientist.	Harvest
126	Ignition of underburning may occur in RHCAs but ignition shall not occur within 25 feet of the edge of the stream channel; fire may be allowed to back into riparian areas.	Fuels treatments
127	Firelines shall not be constructed within RHCAs except fireline may be constructed by hand within RHCAs where needed to control burning near sensitive areas and private property.	Fuels treatments
128	Waterbars shall be installed on fireline for each 10 feet of elevation change due to the widespread occurrence of soils that tend to channel overland flow when disturbed. Utilize natural barriers such as existing roads and streams when constructing fireline. Machine fireline shall be rehabilitated to a natural state after use. Fireline construction shall not occur down draw bottoms or on sensitive soils (see Botany Design Criteria).	Fuels treatments
129	Grapple piling shall not be located within RHCAs.	Fuels treatments
130	Felled trees from juniper thinning activities shall be left in place or re-oriented to slow overland flow unless fuel loading objectives are likely to be exceeded.	Fuels treatments
131	The project hydrologist or soil scientist shall approve drainage and soil stabilization measures for new trail locations and (engineering) designs, prior to implementation. The project hydrologist or soil scientist shall approve selection and application of Watershed Best Management Practices for trail maintenance and relocation and design and implementation of other recreation-related activities including improvements at Magone Lake Recreation Area in advance.	Trail construction
132	There shall be no measureable loss in stream side shade within the project planning area from fence construction on fishbearing streams. If a measurable	All project activities

Project design criteria number	Project design criteria description	Applies to
	reduction in stream shade cannot be avoided, the project will be designed to obtain recovery of stream side shade within an approximate five year period, including the use of riparian plantings.	
Fuels		
133	Control lines used for prescribed fire will be located along natural barriers such as roads or other areas where fire can no longer spread due to a lack of burnable vegetation. Firelines may be constructed by hand or machine to prevent fire from entering sensitive areas or non-Forest Service land. Firelines will be rehabilitated to a natural state and water barred as needed.	All areas with prescribed burning

Attachment 1: Aquatic Design Features and Best Management Practices

Section A: This section includes provides guidance for water drafting activities mainly associated with road maintenance and non-emergency fire suppression activities in the Blue Mountain Tri-Forest area (Umatilla, Malheur, and Wallowa Whitman National Forests). The goal is to create an understandable and workable protocol that will allow water drafting to occur while avoiding or minimizing risks to Endangered Species Act-listed fish.

Section B: This section includes criteria that serve as an addendum to current National Marine Fisheries Service gravity intake juvenile fish screen criteria. These criteria apply to new pump intake screens and existing inadequate pump intake screens, as determined by fisheries agencies with project jurisdiction

Section C: This section includes road maintenance activities and the relevant project implementation criteria described in the Malheur National Forest Road Maintenance Program Biological Assessment.

Section D: This section includes aquatics project design criteria developed by the Blue Mountain Ranger District interdisciplinary team.

Section E: This section describes key best management practices that have been selected.

Section A—General Water Drafting Guidance for Road Maintenance and Non-emergency Fire Use for Watersheds with Anadromous Fish in the Blue Mountain Tri-Forest Area

Within the Blue Mountain Tri-Forest area (Malheur National Forest, Umatilla National Forest, and Wallowa-Whitman National Forest), water drafting regularly occurs to accomplish road maintenance activities as well as control fires. Because of the wide distribution of Endangered Species Act (ESA)-listed anadromous salmonids within the Tri-Forest area, and frequency of drafting water for Federal activities, there is potential for water drafting activities interfering with ESA listed anadromous salmonids. This is particularly true in northeast Oregon where streams used for water are small and support ESA-listed anadromous salmonids.

Water drafting for road maintenance activities can happen at any time of the year, though the largest water withdrawals typically occur in spring. Water is used to soften soil for road shaping, grading, and rocking. These activities usually involve tanker trucks ranging from 500 gallons to 3,500 gallons which fill their tanks from local surface water sources and distribute water on roads as they drive. Most tankers used for this application are equipped with power take off (PTO) pumps which are powered by the vehicles engine. PTO pumps for these types of tankers typically range from about 150 gallons per minute (gpm) (approximately 0.3 cubic feet per second (cfs)) to about 550 gpm (approximately 1.2 cfs) and are often not capable of varying pump rates. Because these types of pumps are capable of removing large volumes of water at high rates, and streams available for water drafting are often small, it is important to avoid or minimize the potential to harm or harass ESA-listed anadromous salmonids.

Water drafting for prescribed fire use can vary from use of small pumps (less than 40 gpm/0.1 cfs) for direct use with hoses to larger pumps as described above for filling tanks or water tenders.

Regardless of pump rate, physical damage to redds, spawning adults, or juveniles can occur from incorrect placement of water drafting equipment. Proper equipment handling and placement in sensitive areas is important to reduce the likelihood of direct harm of ESA-listed anadromous salmonids.

This document provides guidance for water drafting activities mainly associated with road maintenance and non-emergency fire suppression activities in the Blue Mountain Tri-Forest area (Umatilla, Malheur, and Wallowa Whitman National Forests). The goal is to create an understandable and workable protocol that will allow water drafting to occur while avoiding or minimizing risks to ESA-listed fish.

The following guidance is intended to minimize or avoid adverse effects to listed fish in the Blue Mountain Tri-Forest area when engaging in water drafting activities. As with any activity, site specific or project specific information may require more stringent or relaxed criteria to avoid adverse effects. In addition, compliance with these criteria may not minimize adverse effects to avoid take of listed fish in all cases, and therefore does not preclude the need for consultation. Projects will be reviewed on a case by case basis to ensure that guidance is reasonable, prudent, and adequately avoids or minimizes adverse effects to listed species.

1. Any intake used for drafting water will be screened according to National Marine Fisheries Service Juvenile Fish Screen Criteria for Pump Intakes for salmonid fry (see Section B).
2. Non-stream water (i.e., ponds) sources will be used prior to the use of stream sources whenever feasible.
3. When non-stream sources are unavailable, streams with the greatest flow will be used whenever feasible.
4. Water withdrawal will not reduce stream flow by more than 1/10th. In order to accomplish the lowest reduction of flow from marginal water sources (sources in which water drafting will reduce flows by more than 5 percent), the lowest drafting rate on pumps that have adjustable draft rates, and the smallest volume tender appropriate for the project will be used. Whenever feasible, marginal water sources will be avoided.
5. During drafting, streams will be monitored for reduced flows. If a flow concern is identified, operators will reduce pumping rates to ensure that flow reduction is not more than 1/10th of the existing stream flow is being removed or discontinue drafting.
6. If marginal water sources are used, withdrawal from single marginal sites will be limited to 18,000 gallons per day.
7. No more than one high-volume pump per site will be used, except sites in which the use of multiple pumps will not measurably decrease stream flows.
8. To avoid disturbing fish that may be spawning, No drafting will occur from any pools which contain adult salmonids.
9. Operators will avoid direct effects to redds or pre-emergence alevins by placing the intake hose in the deepest part of a drafting pool (where redds are unlikely to be present) and will avoid placing equipment on areas that redds are known or suspected to be. Operators will also ensure that tailout areas of pools that are known or suspected to have redds will not be dewatered.
10. Blading, shaping, aggregate placement, and dust control should be performed in spring and early summer when flows are high, to take advantage of available road soil moisture content to minimize the need for water drafting. Exceptions during the low-flow period will be limited to roads receiving heavy summer through fall traffic creating hazardous road surface conditions that require maintenance for human safety reasons. Essential maintenance during low-flow conditions will be deferred, when possible, until fall precipitation reduces the need for water drafting. Spring and fall blading and shaping will minimize demands for water usage, will minimize dust production, and will reduce sediment generated from surface erosion.
11. National Marine Fisheries Service may periodically review drafting activities to ensure that these measures are adequate for the protection of listed fish.

Section B—National Marine Fisheries Service Juvenile Fish Screen Criteria for Pump Intakes

The following criteria serve as an addendum to current National Marine Fisheries Service gravity intake juvenile fish screen criteria. These criteria apply to new pump intake screens and existing inadequate pump intake screens, as determined by fisheries agencies with project jurisdiction.

Developed by:

National Marine Fisheries Service
Environmental & Technical Services Division
Portland, Oregon
May 9, 1996

Definitions used in pump intake screen criteria

Pump intake screens are defined as screening devices attached directly to a pressurized diversion intake pipe. Effective screen area is calculated by subtracting screen area occluded by structural members from the total screen area. Screen mesh opening is the narrowest opening in screen mesh. Approach velocity is the calculated velocity component perpendicular to the screen face. Sweeping velocity is the flow velocity component parallel to the screen face with the pump turned off.

Active pump intake screens are equipped with a cleaning system with proven cleaning capability, and are cleaned as frequently as necessary to keep the screens clean. Passive pump intake screens have no cleaning system and should only be used when the debris load is expected to be low, and:

1. if a small screen (less than 1 cfs pump) is over-sized to eliminate debris impingement, and
2. where sufficient sweeping velocity exists to eliminate debris build-up on the screen surface, and
3. if the maximum diverted flow is less than 0.01 percent of the total minimum streamflow, or
4. the intake is deep in a reservoir, away from the shoreline.

Pump Intake Screen Flow Criteria

The minimum effective screen area in square feet for an active pump intake screen is calculated by dividing the maximum flow rate in cubic feet per second (cfs) by an approach velocity of 0.4 feet per second (fps). The minimum effective screen area in square feet for a passive pump intake screen is calculated by dividing the maximum flow rate in cfs by an approach velocity of 0.2 fps. Certain site conditions may allow for a waiver of the 0.2 fps approach velocity criteria and allow a passive screen to be installed using 0.4 fps as implementation criteria. These cases will be considered on a site-by-site basis by the fisheries agencies.

If fry-sized salmonids (i.e., less than 60 millimeter fork length) are not ever present at the site and larger juvenile salmonids are present (as determined by agency biologists), approach velocity shall not exceed 0.8 fps for active pump intake screens, or 0.4 fps for passive pump intake screens. The allowable flow should be distributed to achieve uniform approach velocity (plus or minus 10 percent) over the entire screen area. Additional screen area or flow baffling may be required to account for designs with non-uniform approach velocity.

Pump Intake Screen Mesh Material

Screen mesh openings shall not exceed 3/32 inch (2.38 millimeters) for woven wire or perforated plate screens, or 0.0689 inches (1.75 millimeters) for profile wire screens, with a minimum 27 percent open area. If fry-sized salmonids are never present at the site (by determination of agency biologists) screen mesh openings shall not exceed 1/4 inch (6.35 millimeters) for woven wire, perforated plate screens, or profile wire screens, with a minimum of 40 percent open area.

Screen mesh material and support structure shall work in tandem to be sufficiently durable to withstand the rigors of the installation site. No gaps greater than 3/32 inch shall exist in any type screen mesh or at points of mesh attachment. Special mesh materials that inhibit aquatic growth may be required at some sites.

Pump Intake Screen Location

When possible, pump intake screens shall be placed in locations with sufficient sweeping velocity to sweep away debris removed from the screen face. Pump intake screens shall be submerged to a depth of at least one screen radius below the minimum water surface, with a minimum of one screen radius clearance between screen surfaces and adjacent natural or constructed features. A clear escape route should exist for fish that approach the intake volitionally or otherwise. For example, if a pump intake is located off of the river (such as in an intake lagoon), a conventional open channel screen should be considered, placed in the channel or at the edge of the river. Intakes in reservoirs should be as deep as practical, to reduce the numbers of juvenile salmonids that approach the intake. Adverse alterations to riverine habitat shall be minimized.

Pump Intake Screen Protection

Pump intake screens shall be protected from heavy debris, icing and other conditions that may compromise screen integrity. Protection can be provided by using log booms, trash racks or mechanisms for removing the intake from the river during adverse conditions. An inspection and maintenance plan for the pump intake screen is required, to ensure that the screen is operating as designed per these criteria.

Section C—Relevant Project Implementation Criteria for Road Maintenance Activities

The following road maintenance activities and the relevant project implementation criteria were described in the Malheur National Forest Road Maintenance Program Biological Assessment and are contained in: National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2010. Endangered Species Act – Section 7 Informal Consultation and MSA Essential Fish Habitat Consultation for the Malheur National Forest Road Maintenance Activities 2010-2015 – dated January 4, 2010.

Road Reshaping and Blading

Forest roads can be hydrologically connected to fish bearing waters. Precipitation and snow melt can create runoff that, in turn, can create sediment depositions and delivery to those hydrologically connected roads and streams. Maintenance of the road prisms and the water flow controls incorporated in the roadways are vital to minimizing the deterioration of the ability of the water controls to keep sediment from entering stream systems. Reshaping road surfacing is intended to remove irregularities from the road surface, which can cause the concentration of runoff in amounts, which result in soil and aggregate displacement through rills, ruts, and pot holes. Maintenance Level III and IV roads open to travel on an annual basis and possessing crushed aggregate in the base or surface are shaped at least once a year if funding is available.

Road maintenance activities occur primarily from April 15 to November 1 depending on the actual condition of the road and the moisture level. If rutting will occur, the standard practice is to delay maintenance until the road is dry enough to allow equipment to the site without damaging the road. These activities within riparian habitat conservation areas (RHCAs) including bull trout and steelhead waters will be completed during the appropriate instream work window. Proposals to work outside this window will be reviewed by Malheur National Forest fisheries biologist and or hydrologist prior to taking action.

Design Criteria

- Side casting of materials will not occur where these materials could be directly or indirectly introduced into a stream, or where the placement of these materials will contribute to destabilization of the slope.
- Before working in a RHCA, all heavy equipment or other machinery will be inspected for hydraulic or other leaks. Leaking or faulty equipment will not be used. Equipment with accumulations of oil, grease, or other toxic materials will be cleaned in pre-approved sites outside RHCAs.
- Undercutting of cut slopes will be avoided during ditch maintenance activities.
- Fuel storage and fueling of equipment will not occur within RHCAs.
- Disposal materials will be deposited in approved disposal areas.
- Grader operators will backslope away from areas adjacent to streams where there is a potential for sediment delivery into streams. Sediment control devices will be placed to trap sediment in hot spots where sediment could reach a stream.
- Grassy areas are maintained around culverts to minimize the potential for sediment delivery to streams from road grading. Sediment control devices will be placed to trap sediment in hot spots where sediment could reach a stream.
- Sloughing material is deposited in a disposal site away from any stream and left to vegetate naturally. If the annual amount of slough is substantial and the road has become narrowed by loss of material from cut banks or by machine removal of the slough, the slough material is hauled to an approved stable waste site where it is deposited and seeded.

Drainage Structure Maintenance

Drainage maintenance is one of, if not, the most important item of maintenance. Drainage maintenance is performed in order to disperse runoff and minimize road-generated sediment and delivery to surface waters. Drainage maintenance includes the maintenance of drainage structures including culverts, water bars, drain dips, and ditches. Actions include removal of coarse and fine materials and brush from catch basins, inlets, outlets, outlet channels, leadoff ditches, trash racks, drop inlets, water bars, open-top culverts, and rolling dips.

Drainage structure work accomplished under maintenance includes opening plugged culverts, adding water bars to road surfaces, maintaining and forming drivable drainage dips into road surface, adding ditch relief culverts, replacing plugged or damaged ditch relief culverts, and cleaning drainage ditches. These proposed actions will be reviewed by fisheries biologist and or hydrologist prior to taking action if they occur within Category 1 or in Category 2 streams where sediment could enter fish habitat.

Plugged culverts are opened using hand shovels or power equipment. The material removed by hand is spread away from drainage so it will not fall or wash back into the drainage channel or structure. When cleaned with backhoe, the material is hauled to a disposal area by dump truck away from areas subject to erosion or discharge into streams. These proposed actions will be reviewed by fisheries biologist and or hydrologist prior to taking action if they occur within PACFISH/INFISH Category 1 or in Category 2 streams where sediment could enter fish habitat unless they are emergency situations and are consulted on under emergency consultation procedures.

Roadside ditches and lead off ditches shall be cleaned of any material, which would obstruct the flow of water. When possible, grassed ditches are not disturbed, except where necessary to re-establish functional drainage.

Water bars are used on roads to disperse water at variable intervals to slow the velocity and decrease the volume of water traveling on the road prism, thus decreasing the risk of sedimentation due to erosion. These water bars are cut into the road surface at spacing intervals, which control the accumulation of water volumes and velocities. Backhoes and excavators are generally used to perform drainage repair or replacement.

Design Criteria

- Waste materials removed during maintenance activities and cleaned materials from culverts and open tops will be deposited in approved disposal areas outside flood plains in pre-approved disposal sites.
- Before working in a riparian habitat conservation area (RHCA), all heavy equipment or other machinery will be inspected for hydraulic or other leaks. Leaking or faulty equipment will not be used. Equipment with accumulations of oil, grease, or other toxic materials will be cleaned in pre-approved sites outside RHCAs.
- Berms, sediment basins, or sediment traps will be constructed where required to contain sediment from the damage/repair site.

Ditch Relief Culvert Replacement, Installation, or Removal

Ditch relief culverts remove water from roadside ditches, decreasing sedimentation to streams by reducing the concentration of water exiting roadside ditches. Replacement, removal, or installation of ditch relief culverts can occur outside riparian habitat conservation areas (RHCAs) or in RHCAs, although culverts located in RHCAs are not located in a streambed. Backhoes and excavators are generally used to perform ditch relief culvert construction activities. Ditch relief culvert construction activities outside of RHCAs would occur as part of this consultation but would be limited to dry conditions and would use appropriate sediment control measures to ensure sediment does not reach streams. Ditch relief culverts construction activities occurring inside RHCAs will occur only during dry conditions. Sediment controls will ensure that sediment will not enter streams. The proposed activities will be reviewed by Malheur National Forest fisheries biologist and/or hydrologist before being carried out. Culvert removal, replacement, or installation in perennial or intermittent streams will be consulted on separately as a separate project.

Design Criteria

- Work would be done only during dry conditions.
- During installation, efforts are taken to prevent the escapement of soil into streams.
- Sediment filters, certified weed free hay bales, or other devices will be installed at the culvert outlet if natural filters are not present.
- Culvert work inside RHCAs will be reviewed with engineering and hydrology or fisheries staff and designed to conform the project design criteria, standards, guides, and best management practices.

Sign Maintenance and Construction

When selecting sign locations, sites adjacent to fish bearing streams will be avoided if at all possible to avoid disturbance and potential for sediment delivery to the stream and to prevent the need for brushing for visibility.

Sign maintenance includes: straightening rock basket and sign post, cleaning the sign face, brushing for sign visibility, installing hazard markers that denote road hazards, and replacing missing lag screws.

When a sign degenerates to an unacceptable degree it will be replaced. When not applicable to the public, signs will be removed, covered, hinged, turned, or supplemented with another sign that indicates periods of time that signing is applicable. When signs are installed in rock baskets, the rock basket shall be no less than 113 inches circumference and 32 inches high. For posts 12 feet or higher, baskets shall be no less than 151 inches in circumference and 52 inches high. All posts shall be placed to the proper height and be thoroughly tamped in. They shall in no case be less than 2 feet or a quarter of the post height in the ground, or which is greater. Multiple post installation shall be used on signs 40 inches or more in width. The elevation of the lowest marker (an arrow symbol) will be 4 feet from near edge of road surface to bottom of sign. Reassurance markers or other single route markers will also be 4 feet. Destination and warning (any signs other than route markers) should be a minimum of 5 feet.

Road Snag or Danger Tree Felling

An interagency field guild for Danger Tree identification and response was developed in 2005 and then amended in 2008. The Forest is currently following this direction to comply with Occupational Safety and Health Administration (OSHA) regulations and to maintain safe driving conditions.

Danger trees within a riparian habitat conservation area (RHCA) will be felled and left onsite. Danger trees will not be directionally felled into Category 1 streams as part of this consultation.

Logging Out

Logging out is the bucking, removal, and disposal of downed trees, logs, and debris, which have fallen on or across the road bed or lie within the traveled way, thus presenting safety and access concerns. Logging out is performed to provide safe travel for the road users and provide adequate room to achieve road maintenance activities with maintenance equipment. All roads except Maintenance Level I roads require logging out as part of the road maintenance program, unless funding or priorities determine differently. It is intended for all arterial and main collectors to be logged out as early in the year as possible.

Logging out removes fallen trees, snags, or protruding trees that extend into the travel way. Additional width shall be cleared if needed for maintenance. Any wood, slash or debris over four inches in diameter and 2 feet long either existing or created from logging out operations, will be removed from ditches, drainage channels, traveled way, shoulders, and turnouts and scattered on the downhill slope away from drainage. Trees within the travel way shall be cut, limbed, and placed outside the travel way and turnouts and out of drainages and ditches. Trees standing outside travel way but having branches extending into the area shall be limbed to a height of 14 feet. Trees that are blocking ditches or drainage structures may be cut. Some slash will be used as sediment filters at outlets for cross road drainage. Some of the slash will be chipped and placed on cut or fill slopes or disturbed areas. The chipped material provides sediment control, holds in moisture improving sprouting of native seed, and is incorporated more rapidly into the duff layer.

Any portion of a tree, which has fallen into a riparian habitat conservation area (RHCA) will be left in place outside of the roadway. Merchantable logs outside the RHCA shall be cut and removed from the traveled way to facilitate safe passage and proper maintenance. Non-merchantable logs may be cut any length to facilitate safe removal. If these logs are decked to provide designated firewood to the forest users, the deck will not be adjacent to live streams in order to prevent fuel contamination.

When removing downed logs in the road, which extend into a stream, any material on the fill slope and in the stream will be retained to provide for instream woody debris recruitment. If the woody debris is endangering nearby culverts, bridges, or road fill, the debris will be relocated in its original condition to the fill slope or stream channel downstream of the structure.

Design Criteria

- When removing down logs, which extend into a stream, from a road, any material on the fill slope and in the stream will remain (not be removed) to provide for woody debris recruitment, except in cases where the retention of this material would result in a safety concern (i.e. downstream facilities). Any felled hazard trees or blow down in RHCAs will be left in the RHCA and off the roadway.

Roadside Brushing

Roadside brushing is performed to provide visibility, safe stopping distance, clearance for maintenance equipment, unimpeded travel and unobstructed flow of water by the removal of standing vegetation in ditches which may divert water out of the intended course of flow within the clearing limits. Safety and drainage issues will be the primary need for brushing.

On designated open roads, maintenance Level II, brush is removed when it reaches a damage threshold described below.

The threshold for roadside vegetation is exceeded when:

- Growth blocks the view of oncoming traffic to the degree that a driver could not determine the speed or existence of an oncoming vehicle thus affecting adequate stopping distance.
- Growth interferes with the steady flow of water in ditches or through drainage structures.

Roadside brushing on Level II roads will consist of cutting and disposing of vegetative growth to provide at least 12 feet of continuous traveled way and 8 feet of turnout width where they exist plus any additional width needed for maintenance. All vegetation shall be cut within 2 inches of the traveled way. Limbing may be done with a chainsaw or hand tools. Limbs are cut flush to the tree trunk. Debris from cutting operations shall be removed from the brushed area and scattered or chipped. Some slash from cutting operations will be used as sediment filters at outlets for cross road drainage. Some of the slash will be scattered or chipped and placed on cut or fill slopes or disturbed areas. The chipped material provides sediment control, holds in moisture improving sprouting of native seed, and is incorporated more rapidly into the duff layer.

Roadside brushing along main access roads consists of cutting and disposing of vegetative growth including trees less than 6 inches in diameter. The area to be brushed includes cut slopes, fill slopes, ditches, roadbed, turnouts, and vertical clearance. Additional area shall be brushed on the inside of curves as necessary to achieve adequate sight distance. Trees outside the roadbed or ditch, but within the brushing limits, which are over 6 inches in diameter will be limbed in lieu of cutting. Trimming or limbing may be done with a chainsaw or hand tools. Limbs are cut flush to the tree trunk. Debris from cutting operations shall be removed from the brushed area and scattered or chipped. Some slash from cutting operations will be used as sediment filters at outlets for cross road drainage. Some of the slash will be scattered or chipped and placed on cut or fill slopes or disturbed areas. The chipped material provides sediment control, holds in moisture improving sprouting of native seed, and is incorporated more rapidly into the duff layer.

Design Criteria

- In road segments that parallel stream courses, brushing operations will maintain stream shade along with safety considerations. This may necessitate hand brushing, partial brushing, or limbing, with consideration for providing growth for future shade.
- Brush removal will occur within riparian habitat conservation areas (RHCAs) where safety is an issue. Options other than complete "removal" will be considered in order to leave ground cover to help control water and sediment flow off the road surface into the RHCA and stream channels on sites where brush removal would cause sediment to be delivered to a stream.
- When brush cutting is necessary at stream crossings, it will be cut only to a minimum height of 6 inches above the ground to prevent sediment delivery to a live stream and will be left in ditches. Brush and other standing vegetation provide shade and filtering of dust delivery to streams and will be maintained except where public safety is an issue.
- Roadside brushing that involves more than minimal removal of vegetation (i.e., limbing of trees or removal of brush) in RHCAs will be reviewed by a Malheur National Forest fish biologist or hydrologist.

Dust Abatement

During the summer months some roads will receive dust abatement treatment. Dust abatement is the application of a product, which either bonds dust particles and fines to larger matter or makes them heavier so they tend not to rise with the passage of vehicles. The purpose of dust abatement is to prevent loss of surface fines, enhance vehicle safety, and in some cases, prevent pollution and provide vehicle occupant comfort. **Water is the only agent that will be used for dust abatement within RHCAs.**

Water source development is not part of the action alternatives. Where water can be drafted from designated water sources, it can occur only as long as supply is adequate to provide for both fish and withdrawal. Screens are attached to intake hoses to prevent pulling fish and other small matter. **NOAA FISHERIES developed criteria for pump intake screens will be used on all water pump intakes as described in the attached "Appendix B, Juvenile Fish Screen Criteria For Pump Intakes" (NMFS, May 9, 1996).** Screen mesh openings shall not exceed 3/32 inch for woven wire or perforated plate screens, or 0.0689 inch for profile wire screens, with a minimum 27 percent open area. Trucks will be maintained to prevent oil leaks. Loading is done in a manner to minimize overflowing and discharge of wash into stream.

Storage water will be pumped or gravity fed into a holding tank or pond, using less than ten percent of the stream volume. All systems will have screened intake pipes and return systems will be designed that prevents sediment from entering the stream. The maximum withdrawal from one site in an 8-hour period will be 18,000 gallons of water.

Water drafting guidelines prepared by NOAA Fisheries are included in Appendix A.

Snow Removal

Removal of snow from roads is needed to facilitate logging operations and access for project work (e.g., reforestation). As snow plowing is done in connection or association with timber harvest and/or reforestation, it will be included as an activity with those projects for consultation.

Snow removal is also done to ensure safe and efficient transportation and to prevent unacceptable erosion damage to roads, streams, and adjacent lands. Removal includes the entire road width and turnouts. Snow slides, minor earth slides, fallen timber, and boulders that obstruct normal road surface width, including turnouts, are also removed. If culverts and ditches are restricted by snow or ice, they will be opened to allow proper drainage.

Design Criteria

- Any type of equipment may be used to remove snow, providing:
- Type or use of equipment is not restricted in contract or permit clauses or Forest Road Rules document.
- Equipment is of the size and type commonly used to remove snow and will not cause damage to the road.
- The use of dozers to remove snow requires written Forest Service approval. All equipment shall be equipped with shoes or runners, unless agreed otherwise, that are designed to leave 4 to 6 inches of snow on roadway. Snow will not be completely removed.
- Berms shall be opened (surface trenches or drainage holes) to prevent the accumulation of runoff during melt off. Drainage holes will be spaced as required to obtain satisfactory surface drainage without discharge on erodible fills and will be placed above vegetation filters.
- Side casting of snow will be avoided in areas adjacent to streams where there is potential to cause snow or ice damming.
- Side cast material will not include dirt and gravel.
- Damage from, or as a result of snow removal, will be restored in a timely manner.

Road Closures

Road closure actions will include the installation of a physical device to restrict vehicle traffic. A closed road is an operating facility on which motorized traffic has been removed (yearlong or seasonally). These roads remain on the Forest Road Transportation System. Closed roads may not be drivable because they are usually not logged out or brushed out. They are closed to vehicles except for emergency or permitted use. One objective of road closures is to limit motorized vehicle traffic on native surface roads to reduce erosion. The roads are left in a stable condition and are maintained on an “as needed” basis. Inspections are made following a storm event or at least every 5 years.

Roads are most commonly closed with pole gates, steel gates, closure signs, slash, or earth berms as applicable for effective closure. These roads will be treated to provide self-maintenance prior to closure. Self-maintenance includes a variety of actions. Ditch relief culverts will be removed behind roads closed using earth-berms. Earth berms will not be used on roads with culverts at channel crossings still installed. Water bars will be installed with appropriate skew, outlet, and spacing. Sediment barriers of available woody material such as slash, brush, etc., will be placed at water bar outlets. Side ditches will be bladed where needed; culverts will be cleaned to drain; catch basins will be functional and free of debris. Drain dips, grade sags, and cross ditches will be reshaped/rocked as necessary to assure proper functioning. All actions will be considered on a site-specific basis with each road or road segment actions suited to the needs and condition of the road and related resources.

Road closure actions, whether the initial closure or re-closing a breached road will occur only during sufficiently dry conditions to prevent damage and runoff. Road closure are also confined to time periods such that key fish or spawning areas are not impacted and soil movement is not likely to occur. All road closure activities will be reviewed by a fisheries biologist and who will inspect the site for adequate design criteria. **The Forest will consult separately on road decommissioning projects of any type and on self-maintenance closures, which contribute sediment delivery to water. This would entail removing the road from the transportation system, contouring when needed, and rehabilitation of the area to as natural a condition as possible.**

Material Sources

The Forest maintains an inventory of all active rock material (quarry) sources and many closed, inactive, and unopened sources. Over 28 years ago, the Forest began locating centralized sources to provide rock material needs, especially for those projects that required large quantities of material. A primary goal of centralized sources is to limit the magnitude of surface disturbances while extracting quality materials to meet demand. Most roads which access developed sources have aggregate surfaces.

Some of the larger sites have been designed to impound water. These sites provide storage for rain and runoff, which may be used as water sources for road construction and maintenance activities, dust abatement, and fire suppression. An associated benefit of these ponds is use by wildlife and grazing animals.

Most sources are located in rocky terrain and are at a sufficient distance from any drainages or riparian habitat conservation areas (RHCAs) so as to have no impact on sediment contribution. A few sources have been developed in the past, which are located within RHCA buffers. The portions of sources within RHCAs will not be expanded into the RHCAs.

U.S. Forest Service engineers are responsible for following all Malheur Forest Plan Standards and Guidelines, PACFISH Standards and Guidelines, and PACFISH Riparian Management Objectives. Dust abatement will be used as needed, and safety guidelines will be used.

Section D—Project Design Criteria (PDCs) Relevant to Aquatics Developed by Blue Mountain Ranger District Interdisciplinary Team

Project Design Criteria Relevant to All Project Elements

Aquatics Project Design Criteria

- Riparian habitat conservation areas (RHCAs) for Category 1, 2, and 4 streams and for Category 3 and 4 wetlands shall be consistent with PACFISH (100 to 300 foot standard buffer widths).
- The Forest Service will require a Hazardous Substances Plan and Prevention of Oil Spill Plan from contractor which will be reviewed and approved prior to implementation activities. Fuels and other toxicants shall not be stored within RHCAs, and other provisions of PACFISH Standard RA-4 shall be implemented.
- Inspect all heavy equipment and machinery for hydraulic or other leaks before working near RHCAs. Leaking or faulty equipment will not be used. Equipment with accumulations of oil, grease, or other toxic materials will be cleaned in pre-approved sites outside RHCAs.
- Industrial camping permits will be required. Locations within RHCAs will be coordinated with a Malheur National Forest aquatics specialist before permits are issued.
- Because streams in the aquatics analysis area are deficient in large woody debris (LWD) in accordance with PACFISH Standard RA-2, all trees felled within or into RHCAs (including danger trees, those felled for road construction, aspen restoration, and aquatic restoration) will either be felled into streams where feasible to provide LWD, or left within the RHCA. Trees felled shall be pushed over with rootwad intact where feasible, rather than cutting (unless felled as part of riparian thinning treatments).

Watershed Project Design Criteria

- Apply all applicable best management practices (BMPs) listed in General Water Quality Best Management Practices (USDA Forest Service 1988). Full descriptions of each BMP may be found in the Appendix D. Specific BMPs for watershed and fisheries applicable to this project are: T1-T22, R1-R15, R17-R23, F2-F3, VM1-VM4, RM1, and W5.
- Do not use heavy equipment in RHCAs and do not use off road vehicles within 100 feet of streams, springs, or wetlands. Exceptions include activities associated with road construction, maintenance, decommissioning, culvert installation, and aquatic restoration activities.

Timber Felling

Aquatics Project Design Criteria

- Timber harvest units will not be located within riparian habitat conservation areas (RHCAs.)

Watershed Project Design Criteria

- No timber harvest within ephemeral draw buffer (10 to 50 feet on each side).

Timber Yarding

Aquatics Project Design Criteria

- Skyline yarding corridors (sky roads) and tailholds are permitted across streams. Corridors must be less than 12 feet wide, spaced greater than 100 feet apart when crossing the stream, as close to perpendicular to the channel as possible, and can range from 350 to 1,000 feet in length.

Watershed Project Design Criteria

- Require one end suspension on >90 percent of skyline logging corridors. Logs will be fully suspended over streams.
- Heavy equipment is permitted only at designated crossings within the ephemeral draw buffer.
- Skyline corridors shall be oriented perpendicular across ephemeral draws, not running lengthways along them.

Hauling

Aquatics Project Design Criteria

Log Haul – (Designed to support a “May effect, Not likely to Adversely affect” determination call for Aquatic Threatened, Endangered, and Sensitive species and meet Clean Water Act obligations.)

Log haul will occur on designated haul routes with the following design criteria. If additional haul routes are needed and were not identified during the National Environmental Policy Act (NEPA) process then additional NEPA and consultation may be required.

- Product haul will occur during the commercial use period (June 1 – January 15), unless otherwise authorized by the Forest Engineer. The commercial use period is intended to prevent weather-related road damage, but actual field conditions may necessitate suspending haul to prevent road damage at any time. Product haul is also limited to conditions that will not result in Resource Damage, as described in the June 2009 Malheur National Forest Commercial Road Use Rules (CRUR).
- During product haul, weather conditions are monitored daily for the chance of precipitation by the timber sale administrator, hydrologist or fish biologist.
- During product haul, road conditions shall be monitored by the timber sale administrator daily for indications of road distress, defined in the CRUR as visible road conditions that occur as a result of road use, or a combination of road use and weather, which indicate that damage to a road or the adjacent resources, may occur under existing conditions. Examples of indicators include, but are not limited to, excessive dust, compromised or improper functioning road drainage, muddy ditch water, mud tracked onto asphalt or aggregate surfaced roads, and significant distortions of the road surface such as tracks, ruts, potholes, washboarding, asphalt cracking, or settling.
- Timber haul on gravel and native surface roads will be limited to dry or frozen conditions. Haul will cease at any time when the travelway of the road is wet and turbid water or fines are observed moving off the road surface to ditchlines that deliver to stream channels regardless of time of year.
- Haul will cease under periods of thawing conditions, as this is the most critical period for sediment delivery. Heavy truck traffic during thaw periods can cause failure of the entire road prism and can deliver sediment to streams. The Forest Service will attempt to provide a warning of impending thaw conditions 3 to 4 days before possible shutdown and also attempt to notify purchasers 48 hours before operational shutdown.

- When the timber sale administrator observes indications of road distress during haul (haul should be halted prior to road distress in riparian habitat conservation areas (RHCAs) due to the mechanism for sediment delivery), one or more of the following actions would be taken: 1) perform maintenance work (including installation of additional erosion control materials); 2) change method of operations; 3) strengthen road surface to avoid damage; or 4) suspend operations until conditions change.
- During product haul on native-surface roads, the road surface will be rocked for a distance of 100 feet on either side of approaches to: 1) perennial stream crossings (RHCA Category 1 and 2) and 2) intermittent stream crossings (RHCA Category 4) where they occur within ¼ mile upstream of perennial streams. Rocking will maintain as close to an 8-inch lift as the travelway width allows (minimum 6-inch lift).
- Native-surfaced road crossings on Category 4 streams greater than ¼ mile upstream from Category 1 and 2 streams will be rocked (as described in above bullet) unless identified to be exempt by aquatic specialists. Exceptions to rocking crossings in category 4 streams can be made on a site specific basis, based on professional judgment and consensus of both the hydrologist and fisheries biologist in relation to sediment delivery and resource effects. This will ensure that effects to threatened, endangered, and sensitive species will be considered and the Forest is meeting its obligations under the Clean Water Act.
- Prior to annual haul, mitigations will be implemented to minimize sediment delivery to Critical Habitat for Mid-Columbia River steelhead and Columbia River bull trout where needed as identified by an aquatics specialist. Examples of mitigation measures will include but are not limited to sediment fences or certified weed-free straw bales in ditch lines, mulching or additions of coarse wood to stream channels.
- Apply mitigation and best management practices (BMPs) for dust abatement (water) during dry conditions, as directed by physical scientist or road engineer. Drafting sites should be identified and designated by aquatic specialists. Follow National Marine Fisheries Service (NMFS) drafting guidelines for water withdrawals. Juvenile fish screen criteria for pump intakes. Revised May 9, 1996. Portland, OR: NMFS. Juvenile fish screen criteria. Revised February 16, 1995. Portland, OR: NMFS.

Fuels Treatments

Aquatics Project Design Criteria

- Grapple/hand piling areas will not be located within riparian habitat conservation areas (RHCAs).

Fire and Fuels Project Design Criteria

- Firelines will not be constructed within RHCAs and will be waterbarred on slopes greater than 35 percent. Firelines will utilize natural barriers such as existing roads and streams and will be rehabilitated to a natural state after use. Fireline construction will not occur down draw bottoms. Hand lines may be used to keep fire out of sensitive areas and private property.

Temporary Road and Landing Construction

Aquatics Project Design Criteria

- Landings/staging areas will not be located within riparian habitat conservation areas (RHCAs).
- Temporary roads—see watershed project design criteria.

Watershed Project Design Criteria

- Locate temporary roads outside sediment delivery zones (determined by soil type, ground vegetation, and slope), meet best management practices for controlling surface runoff and erosion, and keep machinery on approved roadway.
- Obliterate temporary roads by some combination of the following: recontouring slopes (removing cut and fill slopes); subsoiling (loosening) compacted soils in a “J” pattern to a depth of 16 inches (unless prevented by bedrock or rock content of soils); pulling berm; pulling slash (where available); planting or seeding disturbed areas with native species that naturally occur in the project planning area to achieve a minimum of 35 percent ground cover; restoring natural drainage patterns and waterbarring as needed; and/or disguising the first hundred yards of travelway with large pieces of organic material such as cull logs and tops of trees. Methods will be determined in consultation with a hydrologist, fisheries biologist, or soil scientist.

Road Maintenance and New Road Construction

Watershed Project Design Criteria

- Utilize erosion control measures (sediment filters or certified weed free straw bales) and operate machinery only on road prism during road construction and maintenance activities.

Culvert Installation

Aquatics Project Design Criteria

- The work period for instream work, including culvert installations on fish-bearing streams will be July 15 through August 15, as specified in the Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources, June 2008.
- Conduct activities during dry-field conditions – low to moderate soil moisture levels.
- Placement of the new culverts would be consistent with Region 6 fish passage guidance and in accordance with the Regional General Permit issued by the U.S. Army Corps of Engineers. Minimization measures for fisheries, watershed function, water quality, and soil conditions include those identified in the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (FWS) 2013 Aquatic Restoration Programmatic Biological Opinion version 2 (ARBO) as well as project design criteria developed by the Blue Mountain Ranger District interdisciplinary team.
- All quality pools (pools greater than 2 feet in depth or pools greater than 1.5 feet in depth with cover) will be noted and designed for retention within the project planning area.
- There should be no measureable loss in stream side shade within the project planning area from culvert replacement/installation on fishbearing streams. If a measurable reduction in stream shade cannot be avoided, the project will be designed to obtain recovery of stream side shade within an approximate five year period, including the use of riparian plantings.

Watershed Project Design Criteria

- In riparian habitat conservation areas (RHCAs) or ephemeral draws, conduct culvert installation, replacement or removal during dry conditions or with approval from the district hydrologist and fish biologist. Prevent erosion of soil into streams during installation using appropriate best management practices (BMPs) (Section E). Cease work if a storm event increases stream flows.

Road Decommissioning

Aquatics Project Design Criteria

- The work period for instream work, including road decommissioning within or immediately adjacent to the active channel will be July 15 through August 15, as specified in the Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources, June 2008.
- Conduct activities during dry-field conditions – low to moderate soil moisture levels.
- Road decommissioning would be completed in accordance with the Regional General Permit issued by the U.S. Army Corps of Engineers. Minimization measures for fisheries, watershed function, water quality, and soil conditions include those identified in the National Marine Fisheries Service and Fish and Wildlife Service 2013 Aquatic Restoration Biological Opinion as well as project design criteria developed by the Blue Mountain Ranger District interdisciplinary team.
- Obtain approval from district fisheries biologist and hydrologist on specific methods for removing culverts from first or second order streams.

Watershed Project Design Criteria

- Decommission roads by some combination of the following: recontouring slopes (removing cut and fill slopes); subsoiling (loosening) compacted soils in a “J” pattern to a depth of 16 inches (unless prevented by bedrock or rock content of soils); pulling berm; pulling slash (where available); planting or seeding disturbed areas with native species that naturally occur in the project planning area to achieve a minimum of 35 percent ground cover; restoring natural drainage patterns and waterbarring as needed; and/or disguising the first hundred yards of travel way with large pieces of organic material such as cull logs and tops of trees. Methods will be determined in consultation with a hydrologist, fisheries biologist, or soil scientist.
- Utilize erosion control measures (sediment filters or certified weed free straw bales) and operate machinery only on road prism during road decommissioning.

“Fish Sticks” and “Fish Crib” Magone Lake Project Design Criteria

Aquatics Project Design Criteria

- All work with heavy equipment would occur over snow and frozen ground.
- All shoreline riparian hardwood vegetation would be left intact.
- Fish cribs would measure 8 feet long by 8 feet wide and 4 feet high. A minimum of 5 feet clearance from the top of the crib to the water surface.
- Certified weed-free rock material from existing gravel pits in the vicinity would be used for ballast.
- A minimum of 12 inches of “good” ice would be required before any small equipment (UTV, skidsteer) would be allowed on ice. When feasible 8 foot logs for cribs would be pulled into place on ice by manual labor and constructed onsite.
- Plowing of snow on ice to clear lake surface prior to construction of fish cribs and placement of fish cribs would only occur after the minimum of 12 inches of ice is met.
- All equipment will be checked for leaks (hydraulic, gas, oil) prior to beginning work.
- All fueling or staging of equipment will occur > 50 feet from the lake shoreline.
- Burn piles would not be located within the wetland RHCA (50 feet) and material from fuels and silviculture treatments would be used to construct fish cribs, and obtain “fish stick” material.
- Diameter of “fish sticks” material would follow silviculture and fuels treatment prescriptions for adjacent uplands on east side of Magone Lake.

- Cabling of material would be kept to a minimum to ensure “fish sticks” do not drift offshore and create boating hazards.

Skidding Across Category 4 Drainages Aquatic Project Design Criteria

- Avoid skidding across drainages with a slope of x percent.
- Skidding across floodplain would be minimized by selecting the shortest route across the channel/floodplain and within the slope criteria.
- Logs and slash would be placed at all crossings within channel and floodplain to minimize soil compaction.
- Height of logs and slash within channel would be dependent on stream bank heights so as to avoid any contact of skidder tires with stream banks.
- Once skidding is complete logs and slash would be spread out across channel and floodplain especially in any visible bare spots where soil may have been exposed.
- See Watershed Project Design Criteria.
- Possible units – units 649, 601, 277, 245, 615.
- Unit 225 and Unit 203 have a class 2 on the other side of the closed road.

Recreational Trail Crossings Project Design Criteria

Recreational trail crossing design would follow the same design criteria as livestock trail crossings within Mid-Columbia River Steelhead Critical Habitat identified within the Malheur National Forest Aquatic Restoration Decision and Aquatic Restoration Biological Opinion (ARBO) II. Livestock are likely to also use the trails in addition to recreationists and would not cross on single logs or bridges therefore recreation trail crossings would follow those design criteria below.

Aquatic Restoration Decision Project Design Criteria for Livestock Crossings and Recreational Trail Crossings within Mid-Columbia River Steelhead Critical Habitat

9. Livestock Fencing, Stream Crossings and Off-Channel Livestock Watering

Livestock Stream Crossings

- i. The number of crossings will be minimized.
- ii. Locate crossings or water gaps where streambanks are naturally low. Livestock crossings or water gaps must not be located in areas where compaction or other damage can occur to sensitive soils and vegetation (e.g., wetlands) due to congregating livestock.
- iii. To the extent possible, crossings will not be placed in areas where Endangered Species Act listed species spawn or are suspected of spawning (e.g., pool tailouts where spawning may occur), or within 300-feet upstream of such areas.
- iv. Existing access roads and stream crossings will be used whenever possible, unless new construction would result in less habitat disturbance and the old trail or crossing is retired.
- v. Access roads or trails will be provided with a vegetative buffer that is adequate to avoid or minimize runoff of sediment and other pollutants to surface waters.
- vi. Essential crossings will be designed and constructed or improved to handle reasonably foreseeable flood risks, including associated bedload and debris, and to prevent the diversion of streamflow out of the channel and down the trail if the crossing fails.

- vii. If necessary, the streambank and approach lanes can be stabilized with native vegetation or angular rock to reduce chronic sedimentation. The stream crossing or water gap should be armored with sufficient sized rock (e.g., cobble-size rock) and use angular rock if natural substrate is not of adequate size.
- viii. Livestock crossings will not create barriers to the passage of adult and juvenile fish. Whenever a culvert or bridge—including bridges constructed from flatbed railroad cars, boxcars, or truck flatbeds—is used to create the crossing, the structure width will tier to project design criteria listed for Stream Simulation Culvert and Bridge Projects under Fish Passage Restoration (PDC 21).
- ix. Stream crossings and water gaps will be designed and constructed to a width of 10 to 15 feet in the upstream-downstream direction to minimize the time livestock will spend in the crossing or riparian area.
- x. When using pressure treated lumber for fence posts, complete all cutting/drilling offsite (to the extent possible) so that treated wood chips and debris do not enter water or flood prone areas.
- xi. Riparian fencing is not to be used to create livestock handling facilities or riparian pastures.

COTA Trail Standards that Apply for all RHCAs

Page 8 Aquatic Environments

Section E—Best Management Practices

Best management practices (BMPs) are the primary mechanism for achievement of water quality standards. This appendix describes key BMPs that have been selected in addition to those listed in Table E-3, Project Implementation Criteria and in PACFISH Standards and Guidelines for implementation with the action alternatives.

BMPs include but are not limited to structural and non-structural controls, operations, and maintenance procedures. BMPs would be applied before, during, or after pollution producing activities to reduce or eliminate the introduction of pollutants into receiving water-bodies.

BMPs are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility. Blue Mountain Ranger District monitors some applications of BMPs to evaluate implementation and effectiveness and to determine if changes are needed.

The Memorandum of Understanding, between the USDA Forest Service and the Oregon Department of Environmental Quality, To Meet State and Federal Water Quality Rules and Regulations, specifically identifies the implementation of site specific BMPs as one of the Forest Service responsibilities to satisfy State and Federal point and nonpoint source pollution control requirements on National Forest Service lands.

Below are applicable BMPs, listed in the General Water Quality Best Management Practices (USDA Forest Service 1988) document that will be used with the Magone Project, along with information as to who will be responsible for implementing them, when they will be done, and a determination of ability to implement, and effectiveness:

T-1 – Timber Sale Planning Process

Estimates have been made on the potential changes to water quality and instream beneficial uses, and are disclosed in the environmental impact statement.

- Responsibility: Project soil scientist and fisheries biologists
- Timing: Prior to activity
- Ability to Implement: High
- Effectiveness: High

T-4 – Use of Sale Area Maps for Designating Water Quality Protection Needs

The sale area map will include locations of streams to be protected and the required harvest method.

- Responsibility: Presale technician
- Timing: Prior to activity
- Ability to Implement: High
- Effectiveness: High

T-7 – Streamside Management Unit Designations

The interdisciplinary team designated PACFISH riparian habitat conservation areas (RHCAs) as streamside management units. RHCAs will prevent potential adverse effects of nearby logging and prescribed burning.

- Responsibility: Presale technician
- Timing: Prior to activity
- Ability to Implement: High
- Effectiveness: High

T-10 – Log Landing Location

Harvest plans will include proposed landing locations. Landing locations and size will be approved in advance by Forest Service personnel.

- Responsibility: Presale technician and sale administrator
- Timing: Prior to and during activity
- Ability to Implement: High
- Effectiveness: High

T-11 – Tractor Skid Trail Location and Design

Harvest plans will include proposed yarding patterns. Skid trails will be approved in advance by Forest Service personnel.

- Responsibility: Presale technician and sale administrator
- Timing: Prior to and during activity
- Ability to Implement: High
- Effectiveness: High

T-13 – Erosion Prevention Measures during Timber Sale Operations

Erosion control work will be kept current.

- Responsibility: Sale administrator
- Timing: During activity
- Ability to Implement: High
- Effectiveness: High

T-18 – Erosion Control Structure Maintenance

The purchaser will provide maintenance of soil erosion control structures as required in the timber sale contract.

- Responsibility: Sale administrator
- Timing: During activity
- Ability to Implement: Moderate
- Effectiveness: High

T-19 – Acceptance of Timber Sale Erosion Control Measures before Sale Closure

The effectiveness of erosion control measures will be evaluated periodically during the life of the timber sale contract.

- Responsibility: Sale administrator and hydrologist
- Timing: During activity
- Ability to Implement: High
- Effectiveness: High

R-1 – General Guidelines for the Location and Design of Roads

Temporary road construction and system road maintenance design creates minimal resource damage.

- Responsibility: Engineering representative and sale administrator
- Timing: Prior to activity
- Ability to Implement: High
- Effectiveness: High

R-2 – Erosion Control Plan

Limit erosion and sedimentation through effective planning and contract administration.

- Responsibility: Engineering representative and sale administrator
- Timing: Prior to and during activity
- Ability to Implement: High
- Effectiveness: Moderate

R-3 – Timing of Construction Activities

Road construction and temporary road construction will occur during minimal runoff periods to minimize erosion.

- Responsibility: Sale administrator and engineering representative
- Timing: During activity
- Ability to Implement: High
- Effectiveness: Moderate

R-6 and R-7 – Dispersion of Subsurface and Surface Drainage Associated with Roads

Ditch relief and cross drainage design will assure intercepted ground water and surface water is moved from road prism before it develops enough energy to undermine cut slopes or erode fill slopes.

- Responsibility: Sale administrator and engineering representative
- Timing: During activity
- Ability to Implement: High
- Effectiveness: Moderate

R-12 – Control of Construction in Streamside Management Units

No road construction is planned within riparian habitat conservation areas.

- Responsibility: Sale administrator and engineering representative
- Timing: During activity
- Ability to Implement: High
- Effectiveness: High

R-18 – Maintenance of Roads

Ditches and culverts will be kept open and ruts repaired

- Responsibility: Sale administrator and engineering representative
- Timing: During activity
- Ability to Implement: High
- Effectiveness: High

R-19 – Road Surface Treatment to Prevent Loss of Material

Watering and grading will be kept on schedule to assure surface material is not lost.

- Responsibility: Sale administrator and engineering representative
- Timing: During activity
- Ability to Implement: High
- Effectiveness: High

R-21 – Snow Removal Controls to Avoid Resource Damage

Snow removal will assure water can drain from road prism before it develops enough energy to erode road surface or fill slopes.

- Responsibility: Sale administrator, engineering representative, and silvicultural representative
- Timing: During activity
- Ability to Implement: High
- Effectiveness: High

R-22 – Restoration of Borrow Pits and Quarries

Borrow pits will be stabilized such that banks are stable and access road provides necessary drainage.

- Responsibility: Engineering representative or sale administrator
- Timing: During activity
- Ability to Implement: High
- Effectiveness: High

R-23 – Obliteration of Temporary Roads

Temporary roads will be decommissioned as described in the biological assessment. Future use of the road would be eliminated, and hydrological function would be restored using subsoiling and seeding as necessary.

- Responsibility: Sale administrator and engineering representative
- Timing: At the end of activity
- Ability to Implement: High
- Effectiveness: High

F-3 – Protection of Water Quality during Prescribed Fire Operations

The prescribed fire will follow the burn plan. Adjustments will be made during firing operations if objectives are not being met.

- Responsibility: Fire management officer, district ranger
- Timing: Prior to and during activity
- Ability to Implement: High
- Effectiveness: High

W-5 – Cumulative Watershed Effects

The interdisciplinary team analyzed and disclosed in the environmental impact statement the effects of the proposed management activities, when added to the existing conditions to ensure cumulative effects do not exceed thresholds of concern or result in adverse (degraded) water quality or channel/fish habitat conditions.

- Responsibility: Project soil scientist and fish biologists
- Timing: Prior to activity
- Ability to Implement: High
- Effectiveness: High